FUNCTIONAL DISORDERS OF THE ALIMENTARY TRACT

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FORMAL DECLARATION

I declare that I have written the dissertation presented to the University of Edinburgh for the degree of Doctor of Medicine.

The dissertation was based upon my own observations and with the exceptions indicated in the text, the data were collected, analysed and interpreted by me.

M.J. FORD

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ABSTRACT OF THESIS (Regulation 8.9)

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le of Thesis FUNCTIONAL DISORDERS OF THE ALIMENTARY TRACT

The frequency, severity and characteristics of symptoms of gastro-intestinal disorder, alcohol dependence and psychiatric illness were assessed both in patients attending their general practitioner and in patients referred to a hospital gastro-intestinal clinic by their general practitioners. No evidence of organic bowel disease was found in 72% of 134 hospital referrals aged 18-60 years. Patients with functional disorders of the bowel experienced abdominal distension, a change in abdominal pain after defaecation and a change in bowel habit at times of abdominal pain significantly more often than patients with organic disease.

There was a significant difference in psychoneurotic profiles between the functional and organic groups. In a further more detailed study of 64 randomly-selected GI patients, previous or current psychiatric illness was established using a formal psychiatric assessment in 54% of the functional group and 12.5% of the organic group, a difference which was statistically significant. Stressful life events occurring in the previous six months were assessed using a modification of the Bedford College Life Events and Difficulties Schedule. Anxiety provoking life situations were found in 30% a proportion which was not significantly different in the functional and organic groups. Psychiatric illness or an anxiety provoking situation preceded the onset of bowel symptoms in two thirds of the functional group but in none of the organic group. Life situations alone however did not appear to cause functional disorders unless they provoked an anxiety state. The implications of these findings are discussed.

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INTRODUCTION

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HISTORICAL ASPECTS

It was not until Vesalius published "De Fabrica" (1543) that the gastro-intestinal tract was described with any semblance of anatomical accuracy. Though it paved the way for a better understanding of gastro-intestinal function, many of the complexities of normal and abnormal gastro-intestinal physiology remain unexplained. In testimony to this difficulty in identifying the pathogenesis of many gastro-intestinal disorders, a great number of names by which a wide variety of conditions have been described has evolved over the years. Many of the variants of functional bowel disorders have been buried by the verbal debris of centuries - [1].

It is widely accepted in medicine that symptoms may have no demonstrable organic cause and in the absence of structural, infective or biochemical abnormalities these symptoms are called functional. Terms such as oesophageal spasm, functional dyspepsia, irritable bowel and spastic colon describe particular features within a group of functional gastro-intestinal disorders. The condition now accepted as the Irritable Bowel Syndrome was recognised as early as 1818 when Richard Powell described four women with "occasional pain in the intestines and derangement of their powers of digestion with flatulence and a sense of suffocation" - [2]. In the 19th century, great attention was paid to the passage of mucus per rectum especially if the mucus was inspissated and passed in the form of a membranous cast of part of the colon. Da Costa described seven cases of membranous

enteritis in 1871 - [3] and White added a further sixty cases termed membranous colitis in 1905 - [4]. Over the ten years 1874-1883, Allbutt identified 139 cases of gastric and abdominal neuralgia which he termed gastralgia, a condition considered to be a neurosis of the viscera - [5].

In a study of patients with chronic or recurrent abdominal pain, Hawkins (1906) noted a group of disorders of intestinal function without organic cause comprising constipation, nervous diarrhoea, mucus colic and others ; he stressed that these disorders were not amenable to surgical treatment - [6]. Ryle (1928) noted that abdominal pain not associated with demonstrable organic disease had previously been referred to as spastic constipation, chronic colospasm, spastic colon and muco-membranous colitis - [7]. In a review of cases termed neurogenic mucous colitis in 1928, Bockus et al. used the presence of a characteristic type of mucus in the absence of sigmoidoscopic evidence of inflammation to characterise their patients and stressed that many had psychoneurotic characteristics - [8]. Further emphasis was given to the association of neurotic traits with functional bowel disorder by White and Jones (1940) who described sixty cases of mucous colitis - [9], and Almy (1951) - [10].

The term Irritable Bowel was first used by Peters and Bargen (1944) in a review article in which the increased incidence of the Irritable Bowel Syndrome during the war time years was considered in part attributable to a

stress reaction - [11]. Amongst these earlier contributions to the literature, however, the study of the clinical features, predisposing causes and prognosis of 130 patients with the Irritable Colon Syndrome by Chaudhary and Truelove (1962) was perhaps the most formulative in characterising patients with the Irritable Bowel Syndrome - [12]. Two distinct patterns of presentation viz. diarrhoea without abdominal pain and alternating diarrhoea and constipation with abdominal pain were identified - [12]. During the last thirty years the medical literature in relation to functional disorders of the gastro-intestinal tract has grown exponentionally and thrown considerably more light on the pathogenesis of these conditions and the characteristics of patients who complain of such disorders.

Concepts of functional disorders.

The concept that many patients present with distressing physical symptoms yet have no demonstrable organic disease has long been appreciated. In a study of 5,000 out-patients attending the Massachusettes General Hospital in 1907, only 53% were found to have organic disease; the other 47% were considered to have functional disorders - [13 + 14]. Since every effort should be made to make a positive assessment of the psychiatric state of such patients, the term functional disorder though descriptive may be clinically unhelpful as it fails to distinguish patients with psychiatric illness from those without - [15]. The absence of organic disease does not necessarily indicate psychiatric illness, [16]. Some patients have personality traits in which the amplification of physical symptoms is a frequent characteristic - [17]. Other patients may be responding to life events and difficulties while others may have no apparent explanation for their symptoms - [18-20].

Though many gastro-intestinal symptoms such as anorexia, weight loss, abdominal pain and bowel disturbance are also prominent symptoms of psychiatric illness, they usually divert attention to the gastro-intestinal tract - [21 - 23]. Using reliable standardised methods, psychiatric illness has been diagnosed in the absence of organic disease in a third of patients attending a General Medical Clinic - [24], a quarter of patients attending a Neurology Clinic - [25] and a third of patients

attending a Gastro-Intestinal Clinic - [21]. Pain is one of the commonest symptoms heralding psychiatric illness and as a subjective experience, is often difficult to assess - [23]. Attempts to distinguish between real and imaginary pain are made more difficult by virtue of the influence of personality and mood on the perception pf pain and the fact that pain may dominate the clinical picture so completely that the psychiatric state may be difficult to assess and the patient unable to identify feelings of anxiety or depression - [26 - 27].

Medicine has never had an adequate understanding or classification of the many patients who consult doctors with symptoms for which no organic cause can be found and further clarification of such patients is greatly needed. Why do some patients present with somatic complaints and minimise the psychological component of their illness? Many of the somatic complaints reported by patients are amplications of normal physiological sensations experienced by the majority of the population at some time - [28]. It seems likely that it is more fruitful to ask why people behave in this way than it is to ask what is the matter with them. If patients complain of symptoms which are widely prevalent and do not normally precipitate requests for consultation, the implication is that there are mediating or vulnerability factors which render the patient less able to tolerate minor discomfort.

Conventional wisdom suggests that the underlying problem is one of a latent psychiatric illness and that in some

instances psychiatric distress has been occasioned by stressful life events and difficulties. However part of the problem is that physicians are conditioned by what social scientists call a "medical model" to assume that every bona fide patient must have a disease of some kind. If no organic disease can be found to account for the symptoms, most doctors tend to oscillate uneasily between two alternatives; either underlying organic disease is being overlooked or the patient is psychiatrically ill. The presentation of psychiatric illness with somatic complaints may reflect the belief that doctors are more interested in physical than emotional complaints and the social stigma attached to psychiatric illness. The situation may be compounded by over-zealous investigations which may act as a powerful reinforcement to the patient's fears and may help localise and perpetuate previously vague and transient symptomatology - [29]. Attempts to categorise patterns of presentation by functional symptoms usually fail as these categories overlap and lack clear definitions. Examples of such categories include hysteria, hypochondriasis, neurasthenia, functional overlay, psychosomatic reaction and malingering.

The concepts of the "sick role" and "illness behaviour" provide a basis for a better understanding of functional disorders. The sick role in society carries with it many privileges; invalids are exempt from normal social obligations e.g. children do not have to go to school and adults do not have to go to work. In addition to the

exemption from the responsibility for their condition there is an unspoken obligation to be kind and sympathetic to such patients as well as to assume their responsibilities for them. The only obligation on the patient is to seek and accept appropriate treatment so that the patient utilises the privileges of the sick role for as short a time as possible. One of the basic priciples of "learning theory" is that patterns of behaviour which are rewarded tend to increase in frequency. The rewards of the sick role are so substantial and are experienced by all of us so often in childhood that it is hardly surprising that not all those who develop symptoms and consult doctors have objective evidence of disease. It can be argued that people who behave as if they were ill when the demands of everyday life become too heavy for them do so because they have learnt to do so in the past.

Illness behaviour might best be classified by three overlapping phenomena; overt and covert organic disease, illness motivated by fear of illness or death and illness rewarded by the advantages of the sick role - [18] and [30]. Learning theory and the sick role model provide a more convincing explanation of the phenomena of psychosomatic and related functional disorders. The sick role is attractive and so liable to be adopted whenever the balance of its advantages and disadvantages outweighs that of health. A small minority may even adopt the sick role all the time as they find the normal demands of life too onerous either because they lack the ability or

the energy to cope successfully or because only when ill do they receive sufficient sympathy and attention from other people.

In the majority, the sick role only becomes attractive when adversity is abnormally great either due to severe stressful life events and protracted long-term difficulties or when the possibility of financial gain increases the attractions of illness still further i.e. compensation neurosis. Hysterical phenomena are seen mainly in the young and immature both because the role of the child and role of the invalid have much in common and because the sick role is easier to adopt for those who have only recently given up the privileges of childhood and who are inexperienced at coping with adult demands. Manipulative behaviour is essentially a strategy for achieving power in a role which does not normally provide it; this is why it is exhibited by children towards their parents, by patients towards their doctors and by women towards their men and not vice versa. Those who are able to command have no need to manipulate. However successful manipulation requires some degree of co-operation by the person manipulated and usually this is only forthcoming if the manipulator is attractive or accepted as seriously ill. It is no accident that so many hysterics are strikingly good-looking or at least were so when they were young. Manipulative behaviour like most other types of behaviour is usually learned in childhood.

One of the great weaknesses of the psycho-analytical concept of hysteria is that it requires a distinction between conscious motivation (malingering) and unconscious motivation (hysterical illnesses). In practise it is often impossible to separate the two and indeed the patient's degree of awareness often varies from time to time. Since patients are sensitive to any insinuation that their symptoms may not be genuine, particularly when they have doubts about this themselves, it is counter productive to question whether or not the patient is aware that the symptoms are feigned. Discussion with the patient about the cause of symptoms will usually precipitate the accusation that the doctor does not believe the patient. The wiser approach is to emphasise that the symptoms are familiar, that serious illness has been excluded and that full recovery can be expected and so avoid discussing the cause, if necessary by a confession of ignorance.

The spectrum of functional disorders of the gastro-intestinal tract

The practice of clinical gastro-enterology is rapidly changing; in addition to the changing prevalence of gastro-intestinal disorders, the increasing pressure on in-patient facilities and improved availability of better diagnostic methods has resulted in an increasingly large proportion of patients being assessed and treated on an out-patient basis. Since most disease index hospital codes include only information on hospital in-patients, there is a relative paucity of information available on the nature of the out-patient work-load in Gastro-Intestinal Clinics. However, previous studies have shown gastro-intestinal disorders are implicated in approximately 10% of general practitioner consultations, 10% of prescriptions, 10% of days of certified incapacity to work, 10% of hospital discharges, 10% of the cost of in-patient treatment and 10% of all deaths - [31 and 32].

Perhaps the most perplexing facet of modern gastro-enterological practice is that of symptoms for which no structural or bio-chemical cause can be identified even though such symptoms are a result of disordered gastro-intestinal function. The proportion of newly referred gastro-intestinal out-patients with functional disorders rather than organic disorders is between 20-50% though there is little information available on the relative frequencies of the different subtypes of functional disorders - [33,34 and 35]. During the five year study

period of patients newly referred to the Gastro-Enterology Clinic at Bristol, 2,000 patients were reviewed of whom 888 were considered to have functional disorders of the gastro-intestinal tract (48%) - [35]. A number of different syndromes were distinguished in patients diagnosed as having functional gastro-intestinal disorders and these included abdominal pain with altered bowel habit (Irritable Bowel Syndrome) 449 patients (50%), painless diarrhoea, 107 patients (12%), endoscopy-negative dyspepsia, 77 patients (9%), painless constipation, 39 patients (4%), depression, 50 patients (6%), anxiety, 24 patients (3%) and miscellaneous conditions including anorexia nervosa, rumination, Munchausen syndrome and bizarre and eccentric personalities - [35].

Initial attempts to categorise patients with functional gastro-intestinal disorders have identified two groups of patients; patients with abdominal pain not associated with a disturbance of bowel habit and patients with a disturbance of bowel habit but without abdominal pain - [12]. Subsequent epidemiological surveys however, using structured questionnaires detailing the frequency and characteristics of gastro-intestinal symptoms, have revealed the presence of 4 distinct though, overlapping functional syndromes in 30% of apparently healthy people - [36 - 37]. The typical symptom pattern of the Irritable Bowel Syndrome (abdominal pain and altered bowel habit) occurred in 14%, functional dyspepsia (non-colonic pain associated with heartburn) occurred in 7%, painless constipation occurred in 6% and painless diarrhoea

occurred in 4% - [36]. These 4 syndromes occurred in 91 of the 301 apparently healthy people participating in the survey of whom only 20, (23%) had consulted a doctor because of gastro-intestinal symptoms in the previous year. Many of the 210 who did not have one of the four syndromes had gut-related symptoms which included the passage of rectal mucus (3%), a feeling of incomplete evacuation (41%), urgency of defaecation (25%), abdominal distension (22%), the passage of faecal scybala (33%), occasional straining at stool (29%) and occasional loose bowel motions (27%). Cluster analysis confirmed that three groups (85 individuals) corresponded closely with the 91 patients with functional bowel disorders with an overall 78% agreement in membership. The Irritable Bowel group showed 100% agreement with the members of the three clusters while the total group with abdominal pain had a 98% agreement.

Such findings lend objective support to the existence of four major clinical syndromes. Though the population surveyed was not randomly selected, similar numbers of patients were recruited in the younger, middle-aged and elderly age groups with approximately equal numbers of males and females. Patients with previously recognised gastro-intestinal disease were excluded and most had not previously consulted a doctor because of gastro-intestinal symptoms. Since the severity of gastro-intestinal symptoms was not assessed, it is not known why those subjects with functional abdominal symptoms who had previously sought medical advice had done so. In

another survey, 789 American medical students and hospital employees completed a similar but self-administered questionnaire; 17% of subjects not seeking health care were considered to have the Irritable Bowel Syndrome. This sub group of subjects was predominantly female and compared with the remaining group of subjects was more likely to use laxatives, more likely to have visited a physician for bowel complaints and more often reported that stress influenced their bowel function - 37.

Both these studies of apparently healthy people have highlighted the need for studies comparing patients with the Irritable Bowel Syndrome attending hospital clinics with subjects not seeking health care but admitting to symptoms compatible with the Irritable Bowel Syndrome. This much needed comparison group of apparently healthy people could help identify the reasons why some patients with the Irritable Bowel Syndrome seek medical advice and others do not. Retrospective studies suggest that psychologically distressed persons use medical services disproportionately - 18. In one prospective study, a strong positive relationship between social and psychological stress and medical consultation was established - 38. In this study educational achievements, marital status and financial income were not found to significantly affect requests for medical consultations; however employment status, female sex, chronic symptoms and psychologial distress significantly influenced requests for consultation. The implication is that the use of medical services is a device which may

enable people to cope with personal stress. Many more people seem to believe they are suffering from ill-health than actually present themselves to their general practitioners'. In the United Kingdom General Household Survey (1977) of the Office of Population Censuses and Surveys, it was reported that 85% of women and 77% of men considered they had a health problem - [39]. If symptoms are so common amongst people who do not consult their doctors it seems clear that the presence of a symptom is often not the sole motivating factor in initiating consultation. When non-consulters have symptoms they tend to have them less severely than patients initiating medical consultation - [40]. Symptom severity increases the likelihood of attendance at the general practitioner but often as a background factor rather than as a precipitant. The influence of symptom severity upon self-referral is greatest when the presenting symptoms are those of anxiety or depression - [40]. Additional modifying factors also include the chronicity and the speed of onset of symptoms together with the distress and disruption occasioned by symptoms - [41]. In a further study of a random sample of 706 subjects, half of whom were recent consulters and half non-consulters, there was a small but significant excess of stressful life situations in the group requesting a medical consultation - [41]. Though many people cope with life stresses without professional help, others seek medical help and by so doing manage to cope. Some, however, succumb to distress and develop psychiatric illness. Though such patients might be helped before the point of breakdown,

it is difficult to identify those in greatest need and indeed what mode of intervention should be employed - [41] - 42.

THE SYNDROMES OF FUNCTIONAL GASTRO-INTESTINAL DISORDERS

Functional dyspepsia

Dyspepsia includes a variety of persistent or episodic conditions characterised by epigastric fullness, bloating, discomfort, burning sensations or pain often related to eating but unrelated to bowel action. Because of the absence of a more precise definition of the syndrome it is difficult to establish the incidence and prevalence of dyspepsia. In one epidemiological survey of a Danish population aged 15 - 70 years, 26% of females and 27% males indicated the presence of dyspeptic symptoms - [43]. On the basis of 13,000 adult autopsies, the prevalence of peptic ulcer is in the order of 14% of males and 8% of females - [44].

In a study of 197 consecutive medical out-patients presenting with upper abdominal pain no underlying cause for dyspeptic symptoms was found in 52% of males and 59% of females - [45]. The percentage of dyspeptic patients without an organic disorder has remained constant at between 30 - 50% inspite of the introduction of air contrast barium X-Rays and endoscopy - [46]. This is surprising since about one-third of patients with negative barium meal examinations are found at endoscopy to have peptic lesions - [47]. Prompt endoscopy in 346 patients presenting with dyspepsia in general practice revealed specific disease of the upper alimentary tract in 180 patients (52%), 99 patients had no abnormality

whatsoever (29%) and a further 67 patients (19%) had non-specific gastric mucosal biopsy changes. In this general practice population of 7,800 patients surveyed over 5 years, 393 patients (5%) presented with dyspepsia - [48]. In a survey of apparently healthy people, 34% had experienced heartburn at least once in the previous year, 21% had heartburn at least monthly and 10% had heartburn at least weekly - [49]. In the same survey, 7% of apparently healthy people regularly experienced dyspepsia characterised by non-colonic pain which was often associated with heartburn - [36]. In an endoscopic survey of 121 patients complaining of heartburn to their general practitioner, no evidence of peptic disorders of the upper alimentary tract could be found in 35 patients (29%) - [50]. In an out-patient study of 154 patients referred to hospital by their general practitioner because of dyspepsia, the final diagnosis of functional dyspepsia was established in 40% on the basis of negative radiological investigations - [51]. The diagnostic accuracy of a computer-aided assessment of these patients' symptoms revealed that only 40% of patients with functional dyspepsia were identified accurately on the basis of a detailed record of their clinical symptoms. It seems clear that the diagnosis of functional dyspepsia rests solely upon the lack of demonstrable organic disease rather than on the identification of any specific symptomatology. Attempts to correlate functional dyspepsia with changes in the mucosa of the stomach and duodenum have met with limited success. Though gastric biopsies are abnormal in 40 -

75% patients with X-Ray negative dyspepsia, there is little symptomatic difference between those who have gastritis and those who don't - [52 - 53]. Similarly it has not been possible to correlate clinical symptoms with the presence of duodenitis as assessed by endoscopic biopsy - [54]. Whether or not gastritis and duodenitis cause dyspepsia and fall within the same clinical spectrum of overt peptic ulceration remains unanswered.

The hallmark of functional dyspepsia, epigastric discomfort, is described as either burning or gnawing in character and is indistinguishable from that of true ulcer dyspepsia; the site of pain is similar and 90% of patients point to the upper abdomen, often the epigastrium - [55]. The periodicity of epigastric pain or discomfort is often like that of classical peptic ulcer in that it may occur before or after meals and is relieved by food or antacids. Many dyspeptics however irrespective of the presence or absence of a peptic ulcer do not fit neatly into this description and are often at considerable variance with the classical picture. Less than 50% of the patients with duodenal or gastric ulcers complain of pain related to meal and 53% of patients claim that eating does not affect their pain - [55]. In functional dyspepsia, nocturnal pain, male preponderance and family history appear to be less obvious than in true ulcer dyspepsia and belching, distension and borborygmi often accompany the postprandial discomfort. Though distension also occurs in 50% of peptic ulcer patients, it is more frequently experienced in the Irritable Bowel

Syndrome - 35, 56, 57 and 58. The degree to which the four principal functional syndromes of the gastro-intestinal tract overlap is appreciable - 36, 53, 56 and 57. In one study of patients with the Irritable Bowel Syndrome, dyspepsia was a significant feature in 87% of patients and included burning epigastric discomfort (65%), nausea (49%), heartburn (26%), and acid regurgitation (37%) - 59. Unfortunately none of these clinical features is sufficiently characteristic of functional dyspepsia to assist in diagnosis and when faced with a patient with dyspepsia it is essential both to accurately assess all clinical symptoms and to pursue further investiations in order to exclude organic disease.

2. Functional diarrhoea

Diarrhoea may be defined as an alteration in the consistency of the stool characterised by looseness and often associated with urgency and frequency of defaecation. In 80% of patients with diarrhoea for which no underlying cause can be found, abdominal pain is also present and the conventional label applied is the Irritable Colon Syndrome - 12. In these patients, diarrhoea alternates with constipation and is usually contemporaneous with abdominal pain.

Painless diarrhoea of functional origin can be impossible to distinguish clinically from the diarrhoea resulting from organic bowel disease. By convention it is commonly regarded as part of the spectrum of the

Irritable Bowel Syndrome though its pathogenesis is equally ill-defined. The clinical characteristics which have been found useful in distinguishing organic from functional diarrhoea include weight loss, nocturnal diarrhoea, faecal incontinence, fever, blood or pus in the stool, previous gastric surgery and stool frequencies in excess of 5 motions per day - [60,61 + 62]. In two studies of chronic persistent diarrhoea, an organic explanation for the diarrhoea was identified in 50% of patients indicating that the diagnosis of functional diarrhoea should not be accepted lightly - [61 - 62]. In a survey of apparently healthy people, painless diarrhoea was the least common bowel symptom and was identified in only 4% of a normal population - [36]. In populations of patients with the Irritable Bowel Syndrome, chronic painless diarrhoea was a feature of only 12% of a total of 1155 patients - [12, 35, 63 and 64].

Though previously described as part of the spectrum of the Irritable Bowel Syndrome it may be more appropriate to regard painless diarrhoea as a distinct clinical entity whose spectrum overlaps both with the Irritable Bowel Syndrome and organic bowel syndromes. Conversely, in patients with ulcerative colitis in remission, symptoms suggestive of an Irritable Bowel-like Syndrome are present in 33% - [58, 65]. In a study documenting the clinical symptoms of patients attending for a barium enema examination, the occurrence of loose, watery stools on more than 25% of occasions was recorded as frequently in patients with a normal barium enema as those with

uncomplicated diverticulosis of the colon. In this study, symptoms of the Irritable Bowel were found in similar numbers in both groups - [66]. Such studies lend support to the concept that in some disorders of the colon e.g. diverticulosis, when symptoms occur they are more likely to be due to the Irritable Bowel Syndrome; in other colonic diseases however e.g. ulcerative colitis the inflammatory process results in symptoms indistinguishable from an Irritable Bowel Syndrome. This overlap of symptoms is such that all patients with functional diarrhoea should be investigated since many diseases can masquerade as functional diarrhoea. Disorders particularly likely to be overlooked by the unwary include alcohol and laxative misuse, inflammatory bowel disorders, lactase deficiency and malabsorption syndromes.

Functional constipation

Though difficult to define, the symptom of constipation usually implies a change in bowel habit with increased straining at stool, a feeling of incomplete rectal evacuation and the passage of faecal scybala. When associated with alternating constipation and diarrhoea, it is generally accepted as part of the spectrum of the Irritable Bowel Syndrome. Constipation may be classified as either spastic or hypotonic, a classification supported by motility studies - [67]. The spastic constipation associated with excessive segmental contraction of the colon is characteristically associated with an empty rectrum and is a frequent accompaniment of

the Irritable Bowel Syndrome - [68]. Hypotonic constipation or dyschezia is associated with reduced colonic motility without abdominal pain and characterised by infrequent voluminous stools and a loaded rectum. It is most often encountered in the elderly - [67]. If the urge to defaecate is repeatedly ignored the rectum accommodates the increasing load and the patient eventually loses awareness of a full rectum. Eventually, impaction of the rectum by solid stool causes dysfunction of the anal sphincter and the liquid stool which bypasses the obstruction results in faecal incontinence.

In surveys of apparently healthy people, painless constipation occurs in 6% of individuals with a prevalence rising from 3% in the younger age groups, 8% in the middle-aged and 20% in the elderly - [36]. Stool frequency in 95% of healthy subjects is between 3 stools per day and 3 stools per week; straining at stool on at least 25% of occasions occurs in 18% of apparently healthy subjects - [37]. In a study of 746 patients with one of the four Irritable Bowel Syndromes , 39 patients (7.5%) were diagnosed as having painless constipation - [35]. Like painless diarrhoea, painless constipation is an uncommon facet of the Irritable Bowel Syndrome exhibiting a considerable overlap with the Irritable Bowel Syndrome.

The Irritable Bowel Syndrome

The Irritable Bowel Syndrome can best be defined by the symptoms of abdominal pain or discomfort associated with

an alteration in bowel habit in the absence of underlying organic disease. Cluster analysis of symptoms of gastro-intestinal disorder has shown that four symptoms occur significantly more often in patients with the Irritable Bowel Syndrome than in any other condition and include abdominal pain relieved by defaecation, abdominal distension and a change in bowel habit at the onset of abdominal pain either with more frequent bowel motions or with looser stools - [56] In addition the passage of rectal mucus and the feeling of incomplete rectal evacuation commonly occur with these symptoms. When the four cardinal symptoms are combined, discrimination between patients with organic disease and patients without organic disease is greatly enhanced. Two or more of these symptoms were present in 91% of patients with the Irritable Bowel Syndrome compared with 30% of patients with organic disease. Three or four of the symptoms were present in 63% of patients with the Irritable Bowel Syndrome and in only 15% of those with organic disease; all four symptoms were absent in only 6% of patients with the Irritable Bowel Syndrome compared with 52% of those with organic disease - [56].

Questionnaire surveys amongst apparently healthy subjects not seeking health care have shown that 17-21% have symptoms of bowel dysfunction which characterise the Irritable Bowel Syndrome - [36 - 37]. Symptoms of bowel dysfunction had resulted in previous medical consultation in one in four of the apparently healthy British subjects with the Irritable Bowel Syndrome compared with one in

two of similar American subjects with the Irritable Bowel Syndrome - [36 - 37].

In studies of patients with functional gastro-intestinal disorders, the Irritable Bowel Syndrome comprises 80% of all such disorders - [12,35 and 69]. Females are more commonly affected than males, the overall sex ratio being in the order of 2:1 - [12, 59, 63, 64 and 69]. The majority of patients are in the 3rd or 4th decade of life and presentation after the age of 60 years is rare - [12, 59, 63 and 69]. The age at onset of symptoms is more difficult to determine but in one series the mean age at onset of symptoms was 28.5 years and the mean age at presentation was 33.3 years - [63]. In a study of 163 patients with the Irritable Bowel Syndrome, the mean age at onset of symptoms was 35 years and the mean age at hospital presentation was 43 years. Only 15% of patients had developed symptoms after the age of 50 years - [70]. Symptoms suggesting disorders outwith the alimentary tract are common in patients with the Irritable Bowel Syndromes and include headaches, dysmenorrhoea and urinary frequency - [63, 69, 71 and 72]. The clinical findings on examination often reveal non-specific abnormalities including cold clammy hands, neurodermatitis, brisk reflexes, and an abnormally tender colon and rectum. [63, 69 and 73]. Previous appendicectomy has been recorded in approximately 30% - 50% of patients with the Irritable Bowel Syndrome, most of the removed appendices being normal - [12, 73, 74 and 75]. In a study of young women presenting with right iliac fossa

abdominal pain, only 11% of the elective appendicectomies compared with 51% of the emergency appendicectomies were diseased - [76]. In one series of 163 patients with the Irritable Bowel Syndrome, 33% of patients had undergone either appendicectomy (20%) or gynaecological surgery (13%); the majority of the appendices removed had been normal - [75]. One patient in five with the Irritable Bowel Syndrome experiences right-sided abdominal pain or discomfort - [12,75].

Characteristics of abdominal pain in the Irritable Bowel Syndrome

The classical precepts underlying an understanding of abdominal pain dictate that visceral pain is felt predominantly in the midline and that the level at which it is perceived corresponds to the dermatomes from which the diseased organ receives its innervation - [77]. In these early studies there is no mention of referral of pain to extra-abdominal sites, the data obtained being derived from balloon distension of the gut. Pain arising from the oesophagus was perceived in the retrosternal region, from the duodenum, in the epigastrium, from the jejunum and ileum in the peri-umbilical region and from the colon in the lower abdomen; all pain was perceived in the midline. By convention, abdominal pain in the Irritable Bowel Syndrome is usually assumed to be colonic origin. However, it has been frequently observed that pain is not perceived in the

midline and may occur anywhere in the abdomen often at more than one site. In one study of 106 patients with abdominal pain due to the Irritable Bowel Syndrome, pain localised to the hypogastric area, a site conventionally considered to represent colonic pain, was a feature in only 25% of patients - [12]. In this same study, pain was identified in the lower abdomen in 28%, in the right side of the abdomen in 18%, in the left side of the abdomen in 17% and in the epigastrium in 8%. Pain at more than one site in the abdomen was experienced in 25% of patients - [12]. The character of the pain was variable; one third of patients experienced continuous abdominal pain or discomfort, half the patients experienced colicky pain and the remainder experienced either both types of pain or alternative descriptions including sharp, knife-like pains. Though pain over the course of the colon was equally likely to be continuous or colicky, pain in the hypogastrium was usually colicky in nature - [12]

The distribution of pain induced by balloon distension of the gut has been studied more recently in both normal subjects and in patients with the Irritable Bowel Syndrome - [78 - 79]. Although the distribution of pain induced by colonic distension in normal subjects conforms to conventional descriptions, in the Irritable Bowel Syndrome pain can be experienced anywhere in the abdomen and occasionally at distant referral sites. In only 50% does balloon distension of the colon reproduce the typical pain previously experienced by Irritable Bowel patients - [78]. Balloon distension of the colon in

normal subjects usually produced lower central and lower left-sided pain. A similar distribution of pain was experienced by patients with the Irritable Bowel Syndrome when the balloon was inflated in the sigmoid colon. When the balloon was inflated more proximally however right-sided and upper abdominal pain often developed. Though right iliac fossa abdominal pain can be reproduced by right-sided colonic distension in the Irritable Bowel Syndrome, some patients also experienced pain in the right iliac fossa following distension of the pelvic colon. Colonic pain can radiate to unexpected referred sites including the lumbar spine, sacro-iliac region, the chest and shoulders - [80]. Balloon distension of the duodenum, jejunum and ileum in patients with the Irritable Bowel Syndrome has confirmed that the site of referral may be anywhere in the abdomen and that such stimuli can both induce and reproduce abdominal pain - [79]. Distension of the proximal as well as the distal gut reproduces the abdominal pain in the Irritable Bowel Syndrome both in site and in character; it has also confirmed the existence of trigger areas for the production of pain in the oesophagus, small bowel and large bowel both in the same patient and in groups of patients supporting the hypothesis that the entire gastro-intestinal tract is affected in the Irritable Bowel Syndrome - [79]. In 9 patients with symptoms suggestive of the Irritable Bowel Syndrome, a correlation was established between large pressure peaks in both the small and large bowel and episodes of pain especially after food; this correlation was established both by

using balloons in the sigmoid colon and rectum and by using a radio-telemetering capsule in the proximal gastro-intestinal tract - [80]. The pain experienced by balloon distension of the colon is usually only felt after the bowel has reached its maximum acceptable diameter when any further inflation provokes a sharp increase in gut wall tension.

Distension pain thesholds in the pelvic colon have been examined by balloon inflation measuring the corrected diameter radiographically after 60ml of air was introduced and recording when the patient first complains of pain - [81]. A significantly higher proportion of Irritable Bowel patients than control subjects complain of pain at a balloon volume of 60ml or less. Using the tension multiple as an expression of the actual tension in the bowel wall surrounding the balloon, it has been shown that normal subjects seldom experience distension pain below 200 units compared with 60% of patients with an Irritable Bowel who complain of pain at tension multiples of less than 180 units - [81]. Nearly 40% of patients described central and upper abdominal pain. In another 40%, pain was associated not with balloon distension but with muscular contraction of the bowel wall demonstrated by cine-radiography following the injection of a peristaltic stimulant. This method was effective in producing mass peristalsis in 70% of patients and precipitated pain during propulsion in 62% of Irritable Bowel patients but in only 7% of normal controls. In 20% of Irritable Bowel patients, the

threshold for distension pain was normal and mass peristalsis was painless; in such patients, the mechanism of their pain remains uncertain. [81]. The hypothesis of colonic hyperalgesia in the Irritable Bowel has not gained uniform acceptance. In a study comparing pain ratings following distension of the sigmoid colon in normal controls, patients with the Irritable Bowel Syndrome and patients who were psychologically disturbed but without bowel symptoms, a linear correlation was found between reports of pain and the volume of distension in all three groups. No significant differences between the proportions of subjects experiencing pain in each group was found and no significant association between pain ratings and measures of anxiety, depression or neuroticism could be established - [82]. In another study however, the incidence of pain during colonic distension was found to be greater in Irritable Bowel patients compared to normals. After 180mls of recto-sigmoid distension, 18% of normal controls and 54% of Irritable Bowel patients reported pain, a difference which was statistically significant - [83]. These conflicting results are difficult to reconcile; though an exaggerated response may be demonstrable it remains ill-understood why some patients experienced the degree of pain described during intestinal distension or contraction. While it is possible that this pain represents the normal perception of abnormal motility it seems more likely that it is an abnormal perception of normal motility.

Cluster analysis, numerical taxonomy and the categorisation of Irritable Bowel Syndromes

Since functional disorders of the gastro-intestinal tract consist of symptoms without underlying disease and with no accepted patho-physiology, conventional classification of these disorders can only be expressed in terms of symptoms or groups of symptoms. Previous attempts at classification have been concerned with two principal axes, abdominal pain and altered bowel habit. This has resulted in four possible variants namely painful constipation, painless constipation, painful diarrhoea and painless diarrhoea - [12 and 83]. Though a useful starting point, application of this classification to groups of patients is limited by the considerable overlap exhibited by patients whose symptoms cannot be so neatly encapsulated and by the degree to which symptoms vary with the passage of time - [57]. Epidemiological surveys in apparently healthy people not seeking health care have established the occurrence of these four overlapping syndromes of functional bowel dysfunction - [36 - 37]. The methodology by which these categories can be more clearly identified - numerical taxonomy comprises mathematical devices known by the terms cluster analysis, discriminant analysis and principal components analysis (factor analysis).

Cluster analysis is based on techniques of measuring the similarity between pairs of individuals in mathematical terms and then grouping together those individuals whose similarity reaches a pre-determined level. No prior

assumptions are made when the data are analysed as to whether or not the population studied is divisible into groups. The method was designed for classification of biological data where groups lacking defining characteristics are not easily distinguished - [84]. When it is possible to divide patients into groups, discriminant and principal components analyses can be applied to calculate which symptoms best identify the group to which a patient belongs. Cluster analysis allows the separation of patients into diagnostic groups and factor and discriminant analysis facilitates the identification of the most important symptoms which distinguish the various syndromes. Cluster analysis proceeds in two stages. First there is the calculation of the similarity between all pairs of patients being classified and the formation of clusters of patients sufficiently similar to one another and dissimilar from the rest to be regarded as a distinct group. The similarity between patients is calculated by comparing the symptoms of each patient with those of every other patient and the relation between any two patients is then expressed numerically as the similarity coefficient. The possible values of any symptom are represented by numbers forming an ordered set. Each symptom is given an equal weighting and their values in each pair of patients are compared and the average difference for all the symptoms can then be calculated. This must lie between 0 and 1 because this is the range for all the attributes. The more similar patients are, the closer to unity this figure becomes. With the use of a

computer, all the similarity coefficients in a matrix are printed and then related patients with high similarity coefficients are grouped together.

When the number of symptoms recorded is too large to allow the symptoms characteristic of the clusters to be determined by simple inspection, a preliminary analysis is necessary in which a comparison is made of the differences between the average values of each symptom in the main groups using Students t tests. The number of attributes which reveal significant differences at the 5% level can then be analysed using discriminant analysis. This process selects first the single most discriminating symptom then the most discriminating pair, triplet and so on, stopping when no further improvement occurs. The discriminant value of the symptoms can be evaluated at each stage of the analysis by seeing what proportion of the cases are in fact mis-classified.

The technique of cluster analysis starts with the two most similar patients as the initial members of the first cluster and the next patient to join is the one closest to either of the initial two. The cluster continues to be built up by the successive addition of single patients until the level of similarity between two patients falls below a pre-determined value. That cluster is then complete and the next cluster begins to form with the most similar pair of patients not already in a cluster. When no sufficiently close pair is found the clustering process stops. A patient who is not placed in a cluster but whose most similar patient is in a cluster, is

described as a satellite of that cluster. A patient not included in a cluster and who is most similar to another patient outside a cluster is described as unplaced. The whole clustering process is repeated as the conditions under which patients join a cluster are relaxed in successive stages. Most significance is attached to those clusters which remain unchanged through several resolution levels. It is possible to represent the difference between patients as a distance. Clusters of patients can then be visualised as groups of points in multi-dimensional space and the result of cluster analysis can be shown in the form of a diagram known as taxometric map. In such a map, groups of similar patients (clusters) can be represented by circles, the diameter of the circle being proportional to the maximum difference within the group and the distance between circles reflecting the overall difference between the groups. This two dimensional projection of the relationships between many patients is a convenient way of presenting computer results.

Though it has been suggested that numerical taxonomy removes the subjective element from the process of classication, this is only a partial truth. In the first place the choice of symptoms is still subjective though the degree of subjectivity can be reduced by using a large number of symptoms. Secondly, the choice of patients is also subjective though this can be overcome to some extent by studying of a consecutive series of patients. Thirdly, the accuracy of the data is open to

criticism especially when dealing with symptoms. Many patients differ in what they mean when they use such common words as diarrhoea, heartburn or flatulence. It is therefore mandatory for investigators to identify vocabulary which is unambiguous. Since a variety of clustering techniques may be used, each with its own criteria for the definition of a cluster, the results will depend in part on the particular technique used. Unfortunately there are no objective statistical tests for assessing the reality of a cluster and there is an automatic bias in that the technique is by its nature looking for clusters. Even in the relatively simple case of a mixture of normal distributions, bias of this kind can be misleading. It follows that numerical taxonomy is largely a descriptive rather than a statistical technique and its results demand critical interpretation.

The more symptoms two patients have in common, the greater will be the similarity coefficient even though there may be important differences between then. The collection of irrelevant data therefore may blur the taxonomic picture, a phenomenon which can be avoided by weighting the attributes. If this is done however the outcome is pre-judged and the taxonomic analysis becomes less objective. When cluster analysis is applied to clinical symptoms considered relevant in an attempt to distinguish functional from organic bowel disorder, four separate but overlapping clusters or syndromes can be identified - [36]. These four syndromes within the

spectrum of functional bowel disorders include painless constipation, painless diarrhoea, the Irritable Bowel Syndrome and functional dyspepsia; such findings lend support to the previously suggested classification based on the presence or absence of abdominal pain and the nature of the disturbance in bowel habit - [12].

Nonetheless the clinical value of this classification of functional bowel disorders ultimately depends upon the validity and consistency of the symptoms which comprise these four clusters - [85]. When the case records of 100 patients with the irritable bowel syndrome were analysed by five independent physicians, concordance with the diagnosis was only identified in 52 patients and no simple explicit descriptive rule could be found to assist diagnosis. - [85]. Though such techniques may prove useful in defining groups of disorders which apparently lack clearcut defining characteristics, as yet it remains to be shown whether these distinct groups have any significant differences in their patho-physiology or response to therapeutic regimens. Furthermore long-term studies are required in order to ascertain whether these four clusters change with the passage of time and to what extent they are influenced by psychological, social or environmental factors - [86].

Patho-physiological mechanisms in the aetiology of functional bowel disorders

1. Physical factors

A. Motility abnormalities

Abnormalities of motility at all levels of the gut have been implicated in the causation of functional abdominal symptoms. Balloon distension of the gut within the oesophagus, jejunum, ileum and colon have demonstrated the protean presentation of functional abdominal pain and support the concept that the whole gastro-intestinal tract is affected in functional disorders of the gut - [78 - 79].

Oesophageal motility studies in patients with the Irritable Bowel Syndrome have demonstrated significantly reduced lower oesophageal sphincter pressures compared with controls. In addition, spontaneous motor activity, repetitive contractions and the presence of variable amplitude and simultaneous waves have all been recorded significantly more often in Irritable Bowel patients - [87]. Such findings may help to explain why the patients with the Irritable Bowel Syndrome complain of upper alimentary symptoms including heartburn and suggest that there may be a more widespread disorder of smooth muscle or its innervation than has previously been considered.

The use of radiotelemetry has demonstrated motor abnormalities in the small bowel in the Irritable Bowel Syndrome including normal motor activity during sleep but reduced motor activity during episodes of abdominal pain [88 - 89]. Studies of small bowel transit time measured by the time between oral ingestion of unabsorbable lactulose and the rise in hydrogen concentration in the expired breath has shown the small

bowel transit time in patients with the Irritable Bowel Syndrome is significantly less than in control subjects in support of an abnormality of small intestinal motility - [90]. Similar studies in normal controls and Irritable Bowel patients have confirmed that small bowel transit times are significantly shorter in patients who complain predominantly of diarrhoea and significantly longer in patients who complain of either constipation, abdominal pain or distension compared with controls - [91]. No significant differences in gastric emptying rates were found. Over half of the patients with an Irritable Bowel reported pain particularly in the right iliac fossa during the test and in 75% of these, the onset of pain was associated with the arrival of food residue in the caecum - [91].

Despite extensive investigation, human colonic motor function remains ill-understood and often confusing because of the multiplicity of techniques employed in attempts to study the colon. Such methods include the measurement of colonic transit time, pressure-sensitive radiotelemetry, pressure-sensitive balloons, water-filled manometry, catheters and smooth muscle myo-electrical recordings. The results obtained are subject to the limitations of the methodology and are often difficult to correlate with the findings of other investators. For example, an increase in intra-luminal pressure sensed by an open-tipped water-filled catheter may be associated with expansion or contraction of the lumen and yields no information as to the movement of intra-luminal contents.

Similarly myo-electrical recording electrodes indicate the changes in smooth muscle membrane potential associated with muscle contraction but yield no information as to the pressure generated or its effects on propulsion or luminal diameter - 92, 93 and 94.

Colonic motor function is primarily dependent on the contraction of the circular layer of smooth muscle. In man this layer encircles the large bowel along its entire length. Circular muscle contraction may occur as a localised and isolated event or as a co-ordinated contraction over a variable length of the bowel. These contractile patterns are of three types : segmental, propulsive or mass movements. Segmental contractions are non-propulsive and result in displacement of luminal contents proximally or distally from the site of contraction. Propulsive contractions result in movement of bowel contents in a specific proximal or distal direction over short distances and mass movements are highly organised contractions that propogate over long lengths of bowel propelling luminal contents from one side of the colon to the other. The longitudinal muscle has little known function in segmental contractile activity but probably results in shortening the bowel during propulsive contractions and mass movements. The control and co-ordination of these contractile patterns is considered to be a function of the intrinsic myo-electrical activity of the colon. The smooth muscle of the colon, like that of the stomach and small intestine, exhibits an intrinsic waxing and waning of membrane

potential known as "slow-wave" activity; this arises from tiny pacemakers in the circular muscle and is propagated for variable distances along the colon at frequencies of approximately 3 - 6 cycles per minute. Such pacemakers function only intermittently and circular muscle contraction only occurs when an action potential discharge is in phase with the slow-wave activity during the period of maximum depolarisation.

The frequency, intensity and types of colonic contractile activity that occur at any given time are influenced by a wide variety of factors in the normal subject including the level of physical activity, the autonomic nervous system, gastro-intestinal hormones, food intake and emotional and psychological factors - [92]. A number of abnormalities of colonic motility have been demonstrated in patients with the Irritable Bowel Syndrome - [92 - 95]. However similar patterns of colonic motility occur in normal subjects under stress and in patients with psychoneurosis but no gastro-intestinal symptoms; it is difficult therefore to interpret their clinical importance - [95 - 96]. The colonic motility abnormalities that have been recorded comprise the following -

1. Correlation of intestinal muscle contraction and abdominal pain.
2. Increased resting colonic motility in patients with abdominal pain and altered bowel habit and decreased resting colonic motility in patients with painless diarrhoea.

3. Increased colonic motility in response to parasympathomimetic drugs.

4. Increased colonic motility in response to food intake.

5. Increased colonic motility in response to cholecystokinin.

6. Increased ratio of 3-per-minute slow wave activity to 6-per-minute activity in patients with the Irritable Bowel compared with normal controls - [83, 92 - 96].

From such studies it is impossible to draw any firm conclusions about the role of disordered gut motility in patients with the Irritable Bowel Syndrome. It remains unresolved whether the abnormalities of motility are myogenic in origin or whether the basic abnormalities lie in the autonomic or hormonal modulation of smooth muscle activity. Similarly it is unknown whether the symptoms characterising the Irritable Bowel are the result of an abnormal perception of normal motility or a normal perception of abnormal motility. Previous studies have reported the effects of stress on gastro-intestinal function and have recorded changes in oesophageal motility - [97], gastric motility - [98], small bowel motility - [99 and 100] and colonic motility - [10, 92, 101 and 102]. Though such studies have improved our understanding of the control of gastro-intestinal motility, no specific or diagnostic abnormalities of motility in Irritable Bowel patients have emerged.

B. Hormones, neuro-transmitters and neurogenic factors

The extrinsic nervous system of the gastro-intestinal tract comprises pre-ganglionic sympathetic fibres from the thoraco-lumbar and hypogastric regions. The ratio of these efferent neurones to the number of ganglion cells in the intra-mural plexuses with which they synapse suggests that gut motility is mainly under the control of the enteric nervous system. Within the enteric nervous system, neural transmission is non-cholinergic and non-adrenergic but may be mediated by Serotonin, Substance P, Somatostatin and enkephalins. The enteric nervous system may inhibit smooth muscle directly and is probably modulated by the extrinsic nervous system by a mechanism which remains to be elucidated. Extrinsic adrenergic inhibition acts directly on muscle beta receptors and indirectly by inhibiting acetyl choline release via alpha receptors. The importance of the various neural elements in the control or modulation of gut motility and myo-electrical activity remains enigmatic.

Little is known of the effects of the regulatory peptides in the enteric nervous system on gut motility. Glucagon, gastric inhibitory polypeptide (GIP), vaso-active intestinal peptide (VIP), secretin, and pancreatic polypeptide (PPP) inhibit gut motility while gastrin, cholecystokinin and motilin stimulate gut motility - [103]. These gastro-intestinal hormones affect the motor activity of the lower oesophageal sphincter, stomach,biliary tract, small intestine and colon. It is

uncertain whether the exaggerated response of gut motility to a meal is the result of increased hormone secretion or increased sensitivity of the gut to the action of normal amounts of hormone. The fact that physiological doses of cholecystokinin have a very much more marked effect on gut motility in some patients than others suggest that the degree of response depends largely on the sensitivity of the smooth muscle and that abdominal pain after food may be the result of an exaggerated motor response to cholecystokinin - [104]. No clinically important abnormalities of fasting or postprandial levels of gastrin, insulin, GIP, PPP, motilin, glucagon or neurotensin have been demonstrated in patients with the Irritable Bowel Syndrome - [105]. In patients with functional bowel disorders, normal levels of motilin and PPP have been reported in response to a water load, the clinical significance of which is unknown - [106]. Although minor abnormalities in plasma levels of gut hormones are found in patients with the Irritable Bowel Syndrome when subdivided into symptomatic groups, no overall pattern of abnormality has emerged.

C. Dietary Fibre Deficiency

Dietary fibre has been suggested as a major protective influence in a number of gastro-intestinal disorders including carcinoma of the colon, diverticular disease and the Irritable Bowel Syndrome - [107]. The dietary fibre hypothesis of Burkett & Trowell suggests that the decrease in fibre content of modern diets due to the use of refined flour has been associated with an increased

incidence of disease in Westernised populations. Much of the protective effect of fibre is thought to be mediated through its effects of increasing stool volume. Fibre appears to decrease intestinal transit time and decrease the re-absorption of water from the faeces in the colon; both defaecation frequency and stool wet weight are increased by dietary fibre. Painter has stated that the symptoms of the Irritable Bowel Syndrome are a reflection of the response of a normal bowel coping with the altered environment produced by the refining of carbohydrates and the subsequent depletion of dietary fibre in the diet - [108]. Rather than the condition being one of the Irritable Bowel Syndrome, Painter believes it would be wiser to consider the disorder as one of the Irritated Bowel Syndrome - [108]. Diverticulosis of the colon and the Irritable Bowel Syndrome are common in Westernised populations but almost unknown in rural Africans. No accurate data is available to compare the symptomatology of Africans and Westerners in support of this anecdotal statment and there is ample evidence that the Irritable Bowel Syndrome pre-dated the introduction of highly refined carbohydrate diets - [109].

Dietary fibre can be classified into functional groups; gums, hemi-cellulose, cellulose and lignin, each of which have different physico-chemical effects - [107 and 110]. Though the two types of fibre, vegetable fibre and cereal fibre, reduce intestinal transit time and increase stool bulk, vegetable fibre exerts its effects by increasing

the bacterial content of the stool while cereal fibre (wheat bran) probably exerts its effects by virtue of its water holding properties - [110]. The water holding capacity of dietary fibre is thought to be more a function of fibre structure than of its chemical composition - [111].

The immense variability of colonic function and faecal output in healthy subjects has rendered comparisons with Irritable Bowel patients difficult; individual stool sizes may vary by a factor of 10 on a day to day basis - [112]. Studies of faecal characteristics in controls and patients with the Irritable Bowel Syndrome have failed to identify any significant differences in faecal wet weight and colonic transit times - [113 - 115]. Studies correlating dietary fibre with personality factors have shown that large differences in faecal output remain even when dietary factors are held constant, and suggest that personality factors pre-dispose to a low faecal output. Personality attributes may help predict the magnitude of the therapeutic response to dietary fibre in patients with the Irritable Bowel Syndrome - [116 - 117]. It appears that psychological factors are as important as dietary factors in influencing stool production and symptom relief.

Detailed dietary histories in controls and patients with the Irritable Bowel Syndrome have not shown any significant difference in total dietary fibre intake - [115, 118]. In the latter study by Fielding & Melvin

however, dietary fibre intake at diagnosis was considered to be significantly less than that of controls. Though the role of dietary fibre in the treatment of the Irritable Bowel Syndrome remains controversial, a postal survey has shown that 90% of British gastro-enterologists still use bran or a high fibre diet in the treatment of the Irritable Bowel Syndrome despite the absence of scientific evidence - [119]. In a study of 20 patients with the Irritable Bowel Syndrome whose symptoms improved on a high fibre diet, the dietary fibre intake had increased significantly; in the 5 patients whose symptoms did not improve despite dietary advice, the dietary fibre intake had not increased significantly - [118]. A study of 26 patients revealed that after a 6 week period on a high cereal fibre diet, symptoms of the Irritable Bowel Syndrome had improved significantly and were associated with objective changes in colonic motor activity. No such improvement was observed on a low fibre diet - [119]. In a randomised double blind trial in 60 patients with the Irritable Bowel Syndrome, symptomatic improvement occurred with equal frequency in patients taking a diet supplemented by vegetable fibre and in patients taking a diet supplemented by a placebo - [117]. In a study of 59 patients with the Irritable Bowel Syndrome, patients received either 30gm of Millers bran biscuits or a matched placebo in a randomised double blind fashion. After a 6 week treatment period there was no significant difference noted with respect to symptom improvement - [120]. Coarse wheat bran was found to be no better than placebo in 38 patients with the

Irritable Bowel Syndrome although its efficacy in constipation was confirmed - [121]. Both bran and placebo significantly reduced the severity of symptoms and while constipation was significantly improved by bran but not placebo, diarrhoea did not improve with bran. The incidence of pain and urgency of defaecation was significantly more frequent on bran compared with placebo. Compared with a baseline period, bran therapy resulted in a reduction in whole gut transit time and an increase in the daily stool weight and the proportion of unformed stools but did not change stool frequency - [121]. Despite the widespread practice of high fibre diets in the Irritable Bowel Syndrome, there is little scientific support to justify this practice and even less implicating fibre deficiency in the pathogenesis of the Irritable Bowel Syndrome.

D. Food intolerance

Many patients consider that the symptoms of their Irritable Bowel Syndrome are exacerbated by certain foods. In one study, 44% of patients with the Irritable Bowel Syndrome had noticed a connection between certain foods and their symptoms; the most commonly incriminated foods included apples, oranges, tomatoes, fresh salads and fried food - [12]. The existence of food intolerance and food allergy is regarded by many clinicians with considerable cynicism and rational study of the putative effects of dietary factors has been made more difficult by unsubstantiated claims that a vast array of symptoms and diseases are attributable to foodstuffs.

The symptoms of flatulence and abdominal distension are often considered by patients with the Irritable Bowel Syndrome to be the result of excessive gas production and lacking adequate objective measures, medical science has tended to accept the patients' objective assessment of the quantity of intestinal gas produced. In a study of 18 patients with the Irritable Bowel Syndrome compared with 10 control patients, no significant difference in the composition or rate of accumulation of intestinal gas could be found. In 6 patients with severe abdominal pain during this study, the intestinal transit time of gas was significantly prolonged compared to the control group - [122]. The conclusion to be drawn is that the symptoms of the Irritable Bowel Syndrome may reflect changes in gut motility rather than increased intestinal gas production.

Patients with a variety of intestinal abnormalities may however have excessive gas production because of associated carbohydrate malabsorption, the most common example of which is lactose malabsorption due to lactase deficiency - [123]. Normal subjects excrete appreciable amounts of hydrogen after ingestion of certain foods, the best studied of which is baked beans. Fractionation studies designed to isolate the flatulence factor in beans have shown that the responsible fraction contains indigestible oligo-saccharides. These oligo-saccharides contain several simple sugars linked by bonds. They cannot be digested by the enzymes present in the small bowel and pass into the colon where they are readily

fermented by bacteria yielding hydrogen and carbon dioxide - [124]. The ingestion of wheat products by normal subjects has also been shown to result in hydrogen production due to incomplete carbohydrate absorption in contrast to the almost complete absorption of gluten-free wheat products - [125]. These findings suggest either that gluten causes malabsorption of wheat starch or that the process of gluten extraction alters the carbohydrate, making it more absorbable. Uncontrolled studies in patients with the Irritable Bowel Syndrome have shown that symptoms may be improved by a gluten-free diet in much the same way as a lactose-free diet improves the symptoms of lactase deficiency - [126].

E. Lactose malabsorption

In human infancy the disaccharidase enzyme, lactase is found in the brush border of the villous epithelial cells of the small intestine. Man is unusual in that in some but not all racial types, intestinal lactase persists into adult life, the most notable ethnic exceptions being Negroes, Asians, and South Americans - [127]. Malabsorption of lactose does not always lead to lactose intolerance the symptoms of which usually include nausea, abdominal distension, abdominal pain and diarrhoea. The clinical effects of lactose ingestion are dose related; only 30 - 60% of lactose malabsorbers will experience abdominal symptoms after 15gm of lactose whereas 70 - 80% experience symptoms after 50gm - [127]. The prevalence of lactase deficiency in adults in the United Kingdom is 5%

- 128. In two studies of patients with the Irritable Bowel Syndrome, the prevalence of lactose malabsorption was considered to be 20 - 50% though the prevalence of lactose malabsorption in the normal population was not recorded - 129 - 130. In a further study, 12% of 81 patients with the Irritable Bowel Syndrome had hypolactasia, a prevalence which was considered little different to that found in health controls - 131. Lactase deficiency was found in only 8% of 200 patients with the Irritable Bowel Syndrome and was not considered to pre-dispose to the development of the syndrome; 5% of 150 normal controls had lactase deficiency established by small bowel biopsy with a lactase activity of less than 0.8units/gm of tissue in the presence of normal histopathology. 128. Although the symptoms of the Irritable Bowel Syndrome are similar to those of lactose intolerance, the proportion of patients with the Irritable Bowel Syndrome who are lactase deficient is not significant higher than in the normal population.

F. Specific food intolerance

Specific food intolerance is a dubious clinical entity for which there is little scientific evidence due to the lack of reliable tests to establish a firm diagnosis. In a study of 100 patients who reacted adversely to one or more specific foods, 93% had pre-existing allergic conditions including asthma, rhinitis, urticaria or eczema and 41% experienced gastro-intestinal symptoms of abdominal pain and diarrhoea - 132. The diagnosis of

food allergy was made on the basis of a definite immediate allergic reaction to specific foods supported by positive skin tests or radio-allergosorbent tests (RAST). The less specific diagnosis of food intolerance is usually reserved for patients in whom there is no such evidence of allergy - [132]. The commonest foodstuffs implicated included milk, eggs, nuts and fish. Of the 88 patients intolerant to these foodstuffs, 49 fulfilled the clinical criteria for the diagnosis of food allergy of which 20 patients had severe abdominal symptoms compatible with the Irritable Bowel Syndrome; 50 of the 100 patients however were aged less than 21 years old - 132.

In a study of 21 patients with the Irritable Bowel Syndrome, specific food intolerance provoking symptoms was recorded in 14 and food intolerance was confirmed in 6 of these subjects when challenged double blind - [133]. The significant elevation in rectal prostaglandin PGE2 production after food challenge suggests that food allergy may be an important mechanism in the production of those forms of the Irritable Bowel Syndrome characterised by diarrhoea. Patients with abdominal pain rather than diarrhoea did not show such pronounced increases in prostaglandin production - [133]. In 19 patients with the Irritable Bowel Syndrome, food hypersensitivity as a cause of presenting symptoms was confirmed by double blind food provocation in only 3 patients each of whom had evidence of associated atopic disease - [134]. This contrasts sharply with the

experience of others claiming that two-thirds of patients with the Irritable Bowel Syndrome have evidence of food intolerance; in two-thirds of these patients wheat was the food most often involved and almost 90% of this study group was non-atopic - [135]. Psychiatric studies in patients referred to an allergy clinic because of suspected food allergy in whom food sensitivity was not confirmed would indicate a high incidence of psychiatric disorder - [136 - 137]. In a study of 49 patients with suspected food intolerance and gastro-intestinal symptoms, 36 failed to improve on a non-allergenic diet. Only 8 of the remaining patients had an identifiable foodstuff implicated in symptomatology of whom only 2 were considered to have specific food intolerance - [138]. It seems clear that the methodology of clinical trials into food allergy in the Irritable Bowel Syndrome remains contentious, a fact reflected by the potential for marked over-diagnosis. Studies attributing a significance to gastro-intestinal symptoms only when symptom scores are at least twice the placebo scores have minimised the false positive findings of food allergy and suggest that in irritable bowel patients, the true prevalence of food intolerance is unlikely to exceed 5% - [139 - 141].

G. Gastro-intestinal infection

Many gastro-intestinal infections may trigger prolonged dysfunction of the gut a fact well recognised by many travellers eg. Dehli belly. Similarly, acute diarrhoea is frequently encountered following treatment with broad

spectrum antibiotics, a phenomenon attributed to changes in bowel flora. The bowel may remain irritable after antibiotic-induced diarrhoea - [109]. It is unclear whether these factors are of true aetiological significance or whether they merely cause the patient to seek advice. In one study of 130 patients with the Irritable Bowel Syndrome, symptoms could be traced to an episode of infective gastro-enteritis in 25% of patients - [12]. However in patients living in areas where gastro-enteritis is endemic such infections are implicated in only 17% of irritable bowel patients - [142].

H. Laxative abuse

In a survey of apparently healthy people, laxatives were used at least each twice each week by 4% of the population not admitting to constipation and 20% of those admitting to constipation - [36]. In 1973, the cost of laxative therapy to the National Health Service was 7 million pounds - [143]. Chronic laxative abuse may result in damage to the myenteric plexuses in the colonic wall and lead to an unresponsive atonic colon with intractable constipation. It is unlikely however that laxative abuse is implicated to any significant degree in patients with the Irritable Bowel Syndrome since in one study only 22% of such patients regularly used laxatives a proportion little different from that reported in constipated patients not seeking health care - [36, 60]. In some instances however patients may not admit to the excessive use of laxatives or may in fact be taking

substances with a laxative effect of which they are unaware eg. excessive alcohol intake and antacid therapy - 61 - 62.

I. Alcohol abuse

Chronic alcohol abuse has long been recognised as a cause of non-ulcer dyspepsia and diarrhoea a fact first recorded by Hippocrates - 144 - 146. Even without recording alcohol intakes, alcohol abuse may be confidently identified as the cause of dyspepsia given certain indicants viz. male sex, single status, nausea and vomiting before breakfast, painless diarrhoea and heavy cigarette smoking - 144. One third of "binge" drinkers experienced diarrhoea as a result of changes in osmotic load, intestinal motility, impaired fluid and electrolyte absorption and excess secretion of intestinal fluids and electrolytes - 145 - 146.

Alcohol abuse has been recorded in 1% of a general practice population, 20% of hospital admissions and 1% of medical referrals to a gastro-intestional clinic - 35, 147, 148. In a study of 97 patients with unexplained abdominal pain, 13% were found to have a previously unrecognised alcohol problem - 23. Despite the known association between alcoholism and gastro-intestinal disorders, few studies have addressed themselves to the possible significance of alcoholism in the Irritable Bowel Syndrome and many have ignored it completely - 12, 35, 69 and 149.

J. Bile acid malabsorption

The efficient entero-hepatic circulation of bile acids produced by the liver ensures that 95% of the total bile acid pool is absorbed in the terminal ileum and only small amounts of the primary bile acids, cholic acid and chenodeoxycholic acid reach the colon. In the colon bacterial action converts cholic acid to deoxycholic acid and chenodeoxycholic acid to lithocholic acid. Bile acids are known to inhibit colonic absorption and are responsible for the diarrhoea which often follows resection of the terminal ileum. The effect of bile acids on the control of colonic motility remains a subject of debate but it seems reasonable to postulate that if bile acids are implicated in dysmotility states of the colon then the two secondary bile acids, deoxycholic acid and lithocholic acid may be involved.

In studies of faecal bile acid excretion in the Irritable Bowel Syndrome deoxycholic acid excretion was significantly lower in patients with the Irritable Bowel Syndrome compared to normal subjects - 113, 114 and 150. Though no detectable difference was found between patients with an Irritable Bowel Syndrome and controls with respect to faecal output or total bile acid excretion, the percentage of water content of the stool in patients with diarrhoea-predominant forms of the Irritable Bowel Syndrome was significantly increased; the presence of primary bile acids in the faeces of such

patients lends additional support to the suggestion that this form of the Irritable Bowel may indeed be a distinct entity - [113 - 114].

Deoxycholic acid is capable of being absorbed to a greater extent by the colon in Irritable Bowel patients and hence greater concentrations of this bile acid come into contact with the colonic smooth muscle for a longer period of time; this may account for the characteristic slow wave electrical pattern seen in such patients - [150]. In a study of the effect of bile acid perfusion on colonic motility in the Irritable Bowel Syndrome, only deoxycholic acid was found to stimulate colonic motility both in normal subjects and in patients with an Irritable Bowel. In addition the colonic smooth muscle in patients with an Irritable Bowel was found to be sensitive to a lower concentration of deoxycholic acid than normal subjects - [151]. Previous studies have identified a small group of Irritable Bowel patients with diarrhoea who have idiopathic bile salt malabsorption - [152]. Such patients may be more easily identified by the assessment of ileo-caecal function as reflected by the absorption of radio-labelled Vitamin B12 and radio-labelled Tauro-cholic acid - [153]. Using this technique some patients considered to have functional diarrhoea have been shown to have an isolated malabsorption of bile salts not associated with any functional abnormality of the terminal ileum - [153 - 154]. It is possible that what has conventionally been considered a functional disorder will, in the light of more sophisticated

investigations, prove to be a disorder of bile acid metabolism.

2. PSYCHO-NEUROTIC FACTORS

Since the early descriptions of patients with the Irritable Bowel Syndrome, many authors have addressed themselves to the contribution by the psyche to the Irritable Bowel and have been impressed by the abnormal personalities in many of such patients - [69]. Tension, anxiety, guilt and resentment have been identified as significant factors in the evolution of the Irritable Bowel Syndrome in 50-60% of patients - [2 - 10]. Psychological stress was a notable feature in 80% of the 130 patients described by Chaudhary & Truelove - [12]. More objective assessments of the psycho-neurotic characteristics of patients with the Irritable Bowel Syndrome have substantiated these early clinical impressions.

Hislop assessed the prevalence of psychological symptoms in 67 patients with the Irritable Bowel Syndrome compared with 67 matched control subjects - [155]. Symptoms of an affective disorder including mood disturbance, fatigue, insomnia and weeping occurred with significantly greater frequency in patients than in controls and in females than in males; symptoms of altered affect were present in 90%. Depression was diagnosed in 70% of the patients and after 3 months treatment with an anti-depressant, 80% reported a significant improvement in affect. In a

study of 96 patients referred with abdominal pain for which no immediate explanation could be found, only 15 patients were subsequently found to have an organic disorder. In the majority, 86%, psychiatric factors were considered to be the prime factors and included depression in 32%, chronic anxiety in 22% and hysterical disorders in 18% - [23]. In a study of 41 patients with the Irritable Bowel Syndrome, 25 matched subjects with psycho-neurotic disorders and control subjects from the general population, a personality inventory and psycho-neurotic profile were used to compare the groups - [156]. The mean scores of the personality inventory and psycho-neurotic profile in patients with the Irritable Bowel Syndrome fell between the mean scores of control subjects and matched psycho-neurotic patients and differed significantly from these two groups. A positive association between the Irritable Bowel Syndrome and neurotic personality and psycho-neurotic disorder was established though it was difficult to evaluate the significance of such characteristics in individual patients - [156].

Severe neurotic disorders as measured by the Crown & Crisp Experiential Index (CCEI) can be found in nearly 10% of the general population - [157 - 158]. Whether or not such individuals seek help from doctors is determined by many factors and if and when they do, they may then complain of symptoms which may or may not be directly related to a psycho-neurotic disorder. Conversely chronic physical disability can promote neurotic

symptoms. In a similar study of the degree of neuroticism in patients with ulcerative colitis and general medical patients, patients with functional diarrhoea without abdominal pain were significantly more anxious than the control population of general medical patients - [159].

However in patients with a typical Irritable Bowel Syndrome, the degree of neuroticism did not differ significantly from the control or colitis groups. Urinary catecolamine excretion was found to be highest in the 16 patients with functional diarrhoea and correlated with the levels of anxiety and neuroticism a finding supported by a previous study in 18 patients with diarrhoea of nervous origin - [159 - 160].

Psychiatric studies in 25 patients with the Irritable Bowel Syndrome revealed only 8% of patients were not psychiatrically ill; 24% suffered from an anxiety neurosis and 8% from depression. In the remaining 60% of patients a clearcut psychiatric abnormality was established but difficult to characterise - [161]. Using a structured psychiatric interview, 29 consecutive out-patients with the Irritable Bowel Syndrome were compared with 33 consecutive medical out-patients without the Irritable Bowel Syndrome - [22]. Of the Irritable Bowel patients, 79% were considered to have a significant psychiatric abnormality compared with 18% of the control group; of these one third comprised depression and anxiety neurosis and one third hysterical illness. In a study of 20 patients with the Irritable Bowel Syndrome

compared with patients with ulcerative colitis and appendicitis, psychiatric diagnoses principally depression, hysteria and anxiety neurosis were established in 70% of patients with the Irritable Bowel Syndrome compared with 25% of patients with ulcerative colitis and 15% of patients with appendicitis - [162]. A study of 31 patients with the Irritable Bowel Syndrome reported depressive symptoms in 65% of patients but noted that anti-depressant therapy produced no significant symptom relief compared with placebo - [163].

In studies of psychiatric illness in patients attending their general practitioner, 30% of patients have a significant psychiatric illness as identified by detailed psychiatric interviews and self-administered questionnaires - [164]. Similar studies in patients referred to a Neurological Out-Patient Department have shown that 27% of referrals have a psychiatric disorder - [25]. In a group of 80 patients with diseases of the small intestine, psychiatric illness was established in 34% - [165]. In a psychiatric survey of consecutive referrals to a medical clinic, 32 patients were found to have a functional disorder of the gastro-intestinal tract and 35 patients an organic disorder of the gastro-intestinal tract - [21]. A comparison of the psychiatric characteristics of these two groups revealed psychiatric illness in 50% of the functional group and 20% of the organic group, the principal diagnoses being anxiety neurosis and depression. Personality inventory questionnaires revealed obsessional traits which

correlated significantly with the probability of functional gastro-intestinal disorders - [21].

In a study of the physiological and psychological differences between patients with an Irritable Bowel and normal subjects, patients with an Irritable Bowel showed significantly elevated levels of anxiety, depression and hostility unrelated to the severity of symptoms or alterations in colonic motility - [83]. Previous studies have shown that the experience of pain and emotional stress provokes changes in colonic motility both in normal individuals and in patients with the Irritable Bowel Syndrome - [10, 67, 81 and 101]. Certainly there is a great deal of evidence associating motility disorders, psycho-neurotic abnormalities and the Irritable Bowel Syndrome though it remains unclear as to whether these are cause or effect.

The efficacy of psychiatric treatment schedules and psychotherapy is testimony to the central role of psychological factors in the production and maintenance of the Irritable Bowel Syndrome. In support of this is the finding that most patients feel better and are more able to cope with symptoms despite little or no change in the severity of symptoms during follow-up. The presence of a marked placebo effect as a result of extended follow-up is now well accepted - [163, 166 and 167]. The improvement in well-being in response to medical follow-up however cannot solely be attributed to follow-up. In a control study of 101 out-patients with the Irritable

Bowel Syndrome, half received individual psychotherapy over a 3 month period in addition to medical treatment and half received medical treatment alone. A significantly greater improvement in somatic symptoms was recorded in the psychotherapy group both 3 months and 1 year after entry into the study indicating the long term efficacy of this empathic approach - [168 - 169]. Similar findings have confirmed the efficacy of psychotherapy in a group of 60 consecutive irritable bowel patients over a mean follow-up of two years [170]. In a study of 61 patients with the irritable bowel syndrome, treatment with tricyclic depressant achieved a significant reduction in the symptom scores compared to that achieved by a matched placebo - [171]. However in this study, the improvement in symptoms occurred within the first week of treatment; symptomatic improvement was also recorded in over 60% of the placebo group. The therapeutic response may therefore have been due to drug effects at central and peripheral pain receptors or to the anti-cholinergic effects of the drug rather than to a specific psychotropic effect - [171]. Most recommend that tricyclic anti-depressant therapy is only prescribed for those patients in whom depression is an important component of the presenting complaint - [163]. Since the available evidence suggests that apart from their presenting complaints patients with the Irritable Bowel Syndrome do not differ from neurotic psychiatric out-patients, it seems reasonable to expect that behaviour therapy following behaviour analysis should be effective and that no single treatment will apply to all - [172 - 174].

3. PSYCHO-SOCIAL FACTORS AND STRESSFUL LIFE EVENTS

Stress is a difficult term to define since whilst it infers an excited emotional state, it is both a stimulus provoking a psychological response and it is the response to a provocative stimulus. These stimuli or situations have been called life events and difficulties. Even if every life event is stressful to some degree it does not follow that all life events must be stressful to the same degree and the properties or conditions which distinguish more stressful from less stressful life events are complex. Any assessment of the stress of a life event is subject to three possible sources of error. Firstly since the research regarding life events is often retrospective, the recall of events may be contaminated by the effect of an illness which may have occurred after the event. Secondly there may be an indirect contamination of the recall for the event because of the emotional state of the subject. It is possible that a high level of anxiety for instance might lead both to illness and to a greater tendency to report life events. Finally the scoring of life events may be contaminated because the experience of a life event as stressful may be influenced by a third factor which might also influence the illness in question. For example, a high level of anxiety may lead both to a greater chance of illness and a greater tendency to experience life events as markedly stressful - [175]. It follows that the stressfulness of life events and difficulties is closely

associated with and dependent upon the psychological state of the subject experiencing life events. Patients with troublesome symptoms of an Irritable Bowel are subject to forces that cause them to amplify, focus upon and worry about these somatic perceptions. These forces are psychological, social and cultural and are an integral part of the patient's previous medical and social experience - [17, 176].

Major psycho-social factors and stressful events have previously been recorded in patients with the Irritable Bowel Syndrome. War with its social upheaval, stress and strain was considered to a major stimulus in the development of Irritable Bowel symptoms - [3, 11]. Though in many patients, Irritable Bowel symptoms reflect a psychiatric illness, in others the symptoms appear to arise from everyday problems including changing living accommodation, changing job, financial and domestic difficulties, social crises and bereavement - [72]. In a study of 130 patients with the Irritable Bowel Syndrome, a psychological factor was identified in 65% of the males and 86% of females - [12]. The principal psycho-social factors included marital disharmony and anxiety related to family or business relationships. In a study of 67 patients with the Irritable Bowel Syndrome compared with matched control subjects, marital disharmony, financial and occupational stress and emotional distress in childhood were found in 39%, 18% and 42% of patients respectively compared with 22%, 16% and 31% of control subjects - [155]. An acute episode of psychological

stress resulting from a personal loss or threat occurred in 34 of the 67 patients and included death or severe illness of a close relative (9 patients), surgery (5 patients), and marital or family separation, (8 patients). In most of these situations an element of personal responsibility, self blame or guilt was apparent - [155]. In a study of 333 consecutive patients with the Irritable Bowel Syndrome, an antecedent history of childhood deprivation was common. By the age of 15 years, 31% had lost a parent either through death, divorce or separation, 19% had an alcoholic parent and 61% reported unsatisfactory relationships involving parents. Unfortunately no matched control group was available for comparison and the significance of these findings therefore cannot be clearly evalued - [177].

Stressful life events preceding the onset of illness have been investigated in a consecutive series of 20 patients with the Irritable Bowel Syndrome and 20 patients with ulcerative colitis - [178]. The life events were recorded using a modification of the social re-adjustment rating scale of Holmes & Rahe - [179]. Patients with the Irritable Bowel Syndrome reported a total of 34 events with a mean of 1.7 per patient; those with ulcerative colitis had a total of 27 events with a mean of 1.35 a difference which was not statistically significant. No correlation could be found between the magnitude of the events and the severity or type of illness - [179]. In a previous study of 102 patients with an Irritable Bowel, 158 patients with ulcerative colitis and 735 subjects in

the general population, patients with an Irritable Bowel had consistently higher scores of life stresses - [180]. Though childhood bereavement and a previous history of major illness was more often encountered in the Irritable Bowel population, precipitating stress factors during the six months before the onset of illness were only recorded significantly more often in females with the Irritable Bowel Syndrome and included severe financial and domestic difficulties and bereavement. Similar findings have confirmed the association of the Irritable Bowel Syndrome with a family history of abdominal complaints or death of a close relative - [23, 181]. Distressing life events were assessed during 12 months follow-up of 99 patients with the Irritable Bowel Syndrome - [169]. Distressing life events were reported by 50 patients of whom 38 reported that the event had caused an exacerbation of their Irritable Bowel symptoms.

Several studies have been concerned with the group of patients who are thought to have appendicitis but in whom the appendix is found at operation to be normal. It is important to ascertain the cause of the pain in these cases as the problem is a common one and in the majority of patients, abdominal pain is due to the Irritable Bowel Syndrome and is not relieved by appendicectomy - [75 - 76]. In a review of 1300 appendicectomy specimens, 515 were considered to be normal. Most of these normal specimens were from women and the greatest disparity between the sexes occurred in the age range 11 - 20 years in which 25% of appendices from males and 62% from females were

normal - [182]. It was thought that the pain mimicking appendicitis might in large part reflect a psychological element: "leaving the smoother life of school to start work, having a job that is not liked, quarrelling with a boyfriend and other emotional upsets are commoner at this age than others" - [182]. In another study of 91 women over 15 years of age undergoing appendicectomy, 83% of women who had a normal appendix removed were independently considered as having an emotional problem compared with 17% of those with an inflamed appendix. At follow-up one year after the operation, over half of those who had had a normal appendix removed had continued to have abdominal pain or associated symptoms whereas 90% of those with a diseased appendix had a satisfactory outcome - [76]. Subsequent studies have confirmed that patients who have had a normal appendix removed are more anxious than those with definite appendicitis; this was particularly so amongst women who had had continuous pain rather than discrete episodes of pain, a finding which is known to be associated with depressive illness - [183].

In a study recording life events in the year preceding appendicectomy, acute appendicitis was confirmed histologically in 63 patients and in 56 patients the appendix was not acutely inflamed - [184]. Both groups had experienced more events than a community comparison group when those events which carry some degree of threat to the individual were considered. In the case of severe events however the patients whose appendix was normal demonstrated a pattern similar to that found in

depression whereas those with acute appendicitis were similar to the community comparison group. A follow-up study in these patients demonstrated that the number of threatening events fell to the expected level post-operatively and that the finding of depression was often associated with continuing abdominal pain - [184]. Life events were measured in respect of contextual threat using the Brown & Harris Life Event Schedule - [185]. Severe threatening life events over the 38 weeks prior to onset of illness were experienced by 59% of patients whose appendix was not acutely inflated compared with 25% of those with acute appendicitis. At follow-up 41 patients continued to experience abdominal pain of whom a quarter also experienced bowel symptoms, in the year after operation; 70% of these patients with continuing abdominal pain had had a normal appendix removed. The study did not demonstrate whether the stress was related to the act of seeking treatment or the development of abdominal pain or both. In considering the first possibility it should be noted that the group of people was highly selected. Whereas it can be safely assumed that all those who have definite appendicitis require treatment, this is not so for the remainder who also had an appendicectomy. Only a proportion of those who experience abdominal pain seek medical treatment, only some of these reach hospital and only a small proportion of the latter undergo appendicectomy. Previous studies have shown that the experience of a severe life event is associated with an increased likelihood of a general practitioner consultation - [40, 186]. If the experience

of a severe event is related to the development of abdominal pain there are two principal possibilities. Approximately half of those who had experienced a severe event were depressed and abdominal pain may be a symptom of depression. For the remainder it may be that stress associated with abnormal colonic motility resulted in abdominal pain occurring in the context of an Irritable Bowel Syndrome.

Stressful life situations in gastrointestinal clinic referrals have been studied for the year preceding the onset of abdominal pain, using the Bedford College methodology - [20]. Significant differences were found between patients with organic and functional disorders, in the frequency of stressful events and difficulties occurring in the 38 week period before referral. No evidence of organic disease was found in 59% of the 135 patients studied of whom 57% had experienced a severely threatening event compared with 23% of a community comparison group. The majority of severe events in the functional group involved loss and disappointment and were comparable to those events known to produce depression - [187]. However no psychiatric data were reported and the prevalence of psychiatric disorders in the study group was unrecorded- [20]. It seems clear that in addition to physical and psychological factors, psycho-social events and difficulties also contribute to the production and maintenance of symptoms characterising the Irritable Bowel Syndrome - [188].

CLINICAL MANAGEMENT OF THE IRRITABLE BOWEL SYNDROMES

Syndromes of the Irritable Bowel are no more than clusters of symptoms in the absence of a demonstrable underlying disease reflecting the limited repertoire of responses of the gastro-intestinal tract. Until a clearer understanding of the pathogenesis of these syndromes has been elucidated, the management of these syndromes will remain difficult. The response to therapy of the Irritable Bowel Syndrome is unpredictable and often unsatisfactory. There are few randomised double blind trials assessing the different therapeutic regimens currently available. Most studies have shown a major placebo effect rendering the interpretation of the results more difficult.

The initial enthusiasm for dietary modification has become progressively dissipated by the modest benefit which accrues from the introduction of increased dietary fibre in the diet - [108, 118,119]. Most now agree that the only symptom which consistently responds to high dietary fibre therapy is that of constipation - [117, 120, 121]. Personality factors have been established as major influences in the magnitude of therapeutic responses to such therapy - [116 - 117]. In the small proportion of patients (less than 5%) who are initially misdiagnosed as having the Irritable Bowel Syndrome and who subsequently are shown to have symptoms which relate to lactose intolerance or genuine food allergy, the appropriate dietary modifications can be expected to produce

significant symptomatic relief - [127,139]. Occasionally symptoms may respond to anti-cholinergic therapy by relieving smooth muscle spasm though in general the results of such treatment are unimpressive - [189 - 191]. Reports that Phenytoin decreases intestinal smooth muscle contraction stimulated a randomised double blind crossover study of Phenytoin therapy versus placebo in 12 patients with the Irritable Bowel Syndrome over a 20 week period - [192]. No significant difference in symptom response was observed between Phenytoin and placebo and again psychological factors were noted as significant contributors to the persistence of abdominal pain - [192]. Peppermint oil, a naturally-occurring carminative, has been shown to have potent antispasmodic properties and in a double blind crossover trial in 16 patients with the Irritable Bowel Syndrome over a six week period, a significant reduction in abdominal symptoms was observed compared to placebo - [193].

In view of the psycho-neurotic characteristics of patients with the Irritable Bowel Syndrome, psychotropic drug therapy has been extensively evaluated. When anxiety is a predominant feature, the use of benzodiazepine tranquillizers can be effective - [194]. Double-blind, controlled therapeutic trials of factorial design have shown that combinations of a tranquillizer, Lorazepam, an anti-cholinergic, Hyoscine, and Ispaghula Husk may produce useful additive effects in the relief of symptoms of the Irritable Bowel - [195]. Similar studies also supported the possibility of synergism between such

agents; combinations of Ispaghula, Fluphenazine, Nortriptiline and Mebeverine proved more effective than combinations of bran, Lorazepam and Mebeverine in the Irritable Bowel Syndrome - [196]. Tricyclic anti-depressant therapy is of proven efficacy in double blind crossover trials - [155, 163, 171, 197]. Symptomatic response to this therapy often occurs within the first week of therapy and at dosage regimens usually considered to be sub-therapeutic in depression. In view of the unimpressive efficacy of peripherally-acting anti-cholinergic drugs in the Irritable Bowel Syndrome, it is possible that tricyclic anti-depressants may be producing their effects by a central anti-cholinergic action; tricyclic anti-depressants have been shown to relieve pain of central origin as well as relieving pain of peripheral origin - [197].

In support of an integrated psycho-physiological basis for the Irritable Bowel Syndrome, it has been shown that both brief and prolonged psycho-therapy will result in a lasting reduction of alimentary symptoms, 1-2 years after psychotherapy has been administered - [168 - 170]. In one study of 101 patients with the Irritable Bowel Syndrome, 43 patients completed a course of psychotherapy and 56 patients did not receive psychotherapy. Both groups of patients improved symptomatically and psychologically but there was a significant difference in the improvement in abdominal pain and bowel dysfunction both at 3 months and at 15 months in the psychotherapy group compared to Irritable Bowel patients treated conventionally - [168].

Such studies provide a rationale for a behavioural approach to functional disorders of the gastro-intestinal tract and a possible explanation for the marked beneficial effect of continued follow-up in Irritable Bowel patients - [166, 168, 174]. Improvement in symptomatology may reflect the satisfaction experienced by patients who are referred for further investigation and who obtain a sympathetic explanation of the nature of the underlying disorder - [167]. Similar findings have been recorded in patients referred to a Neurological Clinic because of headaches who experience a non-specific placebo response following the initial clinic consultation as a result of expressed satisfaction with the consultation - [198].

PROGNOSIS IN THE IRRITABLE BOWEL SYNDROMES

In a study of 130 patients with the Irritable Bowel Syndrome, one-third of patients were symptom free over an average follow-up period of 1-3 years - [12]. The length of history before treatment was commenced did not appear to influence the prognosis. The symptom-free state was seen in two-thirds of patients in whom the onset of symptoms was associated with dysentery compared with one-third of patients in whom there was no such history of dysentery. When a significant psychological factor was present, only a quarter of patients without previous dysentery were symptom free compared with half of those patients with antecedent dysentery. When a psychological factor could not be found, half the

patients without antecedent dysentery were symptom free and three quarters of those with antecedent dysentery were symptom free. Of the 17 patients in whom an Irritable Bowel coincided with a major stressful life situation at onset, 76% became symptom free compared with only 22% of the 83 patients not experiencing a major stressful life situation at onset - [12]. At 12 months following hospital referral with the Irritable Bowel Syndrome, all but one of 50 patients experienced no change in the nature of symptoms although the severity varied. One-third of patients expressed improvement in symptoms at this time, half were unchanged and only 12% were symptom free - [166]. In a review of 163 patients with functional diarrhoea 2-20 years after the initial clinic attendance, only 39% were symptom free; 29% experienced intermittent diarrhoea and 21% persistent diarrhoea - [70]. In 4% (6 patients) a new diagnosis had emerged in 3 of whom it was considered that the initial diagnosis of a functional disorder had been made in error. Abdominal pain had been a major complaint in 52% of the 163 patients when first seen confirming the close association of functional diarrhoea with the Irritable Bowel Syndrome - [70].

During an average follow-up of 29 months in 154 patients with the Irritable Bowel Syndrome, 79% recorded an improvement in symptomatology and an underlying organic cause emerged in only 3%. The outcome however was curiously uninfluenced by the identification of psychiatric problems which were present in 32% of

patients using a modest 3-item questionnaire - [167]. In a review of 77 patients with the Irritable Bowel Syndrome 6 years following out-patient referral, a different diagnosis had emerged in only 4 patients and only 38% were symptom free - [199]. The chronic relapsing nature of the Irritable Bowel Syndrome is consistently revealed by follow-up studies; at 3 months 80% of patients experienced improvement in their symptoms but at 6 months only 16% were symptom free - [155,200]. Thereafter only a third of patients will remain persistently symptom free - [12, 70, 166, 199]. Similar findings have been established in the Irritable Bowel Syndrome of childhood. Over 50% of children will have symptoms persisting into adult life - [201 - 204]. One third of adults with the Irritable Bowel Syndrome have had similar symptoms in childhood - [63]. The ineffectiveness of conventional therapy and the limited prognosis remain a testimony to the failure to identify the underlying pathogenesis of functional disorders of the gastro-intestinal tract.

CURRENT CONCEPTS OF PATHOGENESIS

Functional disorders of the gastro-intestinal tract lack a well defined aetiology and patho-physiology and at present no conventional therapeutic approach is of proven lasting efficacy. The two most widely-held beliefs about patients with the Irritable Bowel Syndrome are that they are characterised by a distinctive disturbance of gastro-intestinal motility and that they are psychologically disturbed. The evidence in support of

these two beliefs however remains conflicting and though the current models used to explain the Irritable Bowel Syndrome are inadequate, they remain the foundation on which treatment and research are based.

The models proposed to explain the Irritable Bowel Syndrome fall into four principal areas, gastro-intestinal disease, psychiatric disease, psycho-physiological disorders and behavioural disorders. None explains all of the following characteristics of Irritable Bowel patients:-

1. Patients complain of a wide variety of gastro-intestinal symptoms.
2. Patients complain of symptoms which are not confined to the gastro-intestinal tract.
3. Patients exhibit psycho-neurotic profiles distinct from control subjects.
4. Patients often have a wide variety of psychiatric diagnoses.
5. Patients exhibit the absence of any distinctive or discriminant biological characteristics, physical, physiological or biochemical.
6. Patients closely resemble psycho-neurotic individuals in their psychological and physiological characteristics.
7. Patients respond positively but transiently to a wide variety of treatments.
8. Patients often exhibit symptoms common to other members of their family, especially parents and siblings.

173.

The model of gastro-intestinal disease.

This model presupposes that the primary problem lies within the gastro-intestinal tract and in some cases awaits discovery. Any psychological problems are assumed to be secondary to gastro-intestinal disease and treatment is directed at correcting the underlying biological dysfunction. There are three major problems encountered if this model is to be accepted.

1. The evidence in support of a distinctive abnormality of gastro-intestinal motility is conflicting and inconclusive - 93, 94, 96, 172. Environmental events, stress and psychological factors are known to be associated with changes in colonic motility - 10, 102. Studies attempting to reveal motility abnormalities peculiar to the Irritable Bowel patient must therefore use a control group of patients who are equally psychologically disturbed but without bowel symptoms. In a study designed with this in mind, no significant differences between neurotic and Irritable Bowel patients were found on either colonic motor or myo-electrical parameters - 96. Though a characteristic myo-electrical activity in the recto-sigmoid colon has been claimed, this abnormality has not been confirmed in either Irritable Bowel patients or in neurotic patients without the Irritable Bowel Syndrome - 93, 94, 96.

2. The psychological problems of Irritable Bowel patients are significantly greater than those found in patients with much more severe and disabling gastro-intestinal disease and are therefore unlikely to be

merely a reaction to alimentary symptoms - 159, 180.

3. Primary gastro-intestinal disease does not readily explain the presence of a wide range of non-alimentary symptoms found in the Irritable Bowel Syndrome such as weakness, fatigue, headaches, insomnia, palpitations, frequency of micturition, dysmenorrhea and dyspareunia - 69, 72.

The model of psychiatric disease

According to the psychiatric disease model, the primary problem is the psychiatric illness and the gastro-intestinal symptoms are assumed to be secondary phenomena. It has been argued for example that all patients with the Irritable Bowel Syndrome have an affective disorder - 22, 155, 161. Two major problems are encountered if this model is accepted however.

1. All patients with the Irritable Bowel Syndrome do not have a discrete psychiatric diagnosis and in those who do, there is often a wide variety of psychiatric diagnoses - 22, 161.

2. There are many individuals who are equally as psycho-neurotic with any given psychiatric diagnosis but who do not have the Irritable Bowel Syndrome.

The model of psycho-physiological disorder

In this model it is argued that Irritable Bowel symptoms are the result of physiological changes that normally accompany certain emotional states. In Irritable Bowel patients these changes are presumed to be more intense

and sustained. This model is consistent with many of the findings in the Irritable Bowel Syndrome and is more explicit about the relation between the psychological and gastro-intestinal features present. Advocates of the model have proposed that specific symptoms may result from specific unconscious conflicts, personality profiles, attitudes, constitutional vulnerability, individual response, or visceral conditioning - [172]. The major problem posed if the model is accepted is that there has never been any convincing evidence in the Irritable Bowel Syndrome that the gastro-intestinal physiological responses that normally accompany emotional states are more intense and sustained than in subjects without the Irritable Bowel Syndrome but who are experiencing similar emotions. The hypothesis of colonic hyperalgesia has been previously suggested because of the presence of a lower threshold for pain in response to colonic distension - [81]. This finding however has not been substantiated in studies using normal controls, patients with the Irritable Bowel Syndrome and patients who were psychologically disturbed but without bowel symptoms - [82]. There is ample evidence that certain strong emotions can alter gastro-intestinal physiological responses but as yet there is no good explanation as to why some individuals develop the Irritable Bowel Syndrome while others do not.

The model of behavioural disorders

There is a social dimension to any illness experience which determines how patients perceive, interpret and react to bodily changes - [18]. These social factors may account at the one extreme for the denial of illness which leads many chronically ill people not to take prescribed medicines and at the other extreme for the tendency of some patients to become excessively dependent on physicians and to experience a disability disproportionate to the physical findings - [205]. Learning is one of the factors which determines how an individual reacts to an illness experience. Such learning may result from observing the way others react to their illness and from the way parents and others respond to the subject's somatic complaints. Patho-physiological changes as well as overt illness behaviour may be inadvertently learned when somatic complaints are rewarded. This hypothesis derives from bio-feedback studies which have shown that people can learn to increase and decrease responses such as gastric acid secretion and colonic motility when they are provided with feedback on these responses and are motivated to control them. It can be argued by analogy that a parent may unwittingly encourage abnormal physiological responses by attending to a child and allowing him to stay away from school when he complains of stomach ache - [206].

In a telephone survey of the prevalence of chronic

illness behaviour, 832 people were studied of whom 8% were considered to have an Irritable Bowel Syndrome and 10% a peptic ulcer - [207]. People with the Irritable Bowel Syndrome were more likely than the general population to have multiple somatic complaints and to consult a physician for minor illnesses compared with the peptic ulcer population and the general population. People who recalled being given gifts or special foods when they had a cold or flu as a child were more likely to exhibit chronic illness behaviour and more likely to have an Irritable Bowel Syndrome. Such findings support the hypothesis that social learning may contribute to the aetiology of the Irritable Bowel Syndrome - [207]. The greater incidence of chronic illness behaviour amongst Irritable Bowel patients was not reflected by a higher incidence of psycho-neurotic symptoms; paradoxically, such patients volunteered a past history of psychiatric illness less often than did the rest of the general population. This finding suggests a lack of insight in patients with the Irritable Bowel Syndrome - [207].

The behavioural model of the Irritable Bowel Syndrome has three central features:-

1. The behaviour of patients with the Irritable Bowel Syndrome can be expressed by what the patient has to say about alimentary symptoms, what can be objectively

verified with respect to alimentary symptoms and what physiological responses can be demonstrated in the symptomatic patient. These three axes of behaviour are potentially independent and the assumption that there is a close relationship between the symptoms reported and gastro-intestinal physiological responses is unwarranted. The diagnosis of the Irritable Bowel Syndrome is based entirely on subjective symptomatology after excluding underlying disease. No attempt is made to confirm the frequency, nature or severity of bowel symptoms objectively and there is usually no systematic investigation of physiological function. At present therefore patients with the Irritable Bowel Syndrome are selected for clinical study purely on the subjective basis of the symptomatology.

2. In the Irritable Bowel Syndrome there are only quantitative changes in behaviour with a continuous variation from the extremes of normal to abnormal. There is no clear separation between behaviour universally agreed to be characteristic of the Irritable Bowel Syndrome and behaviour which is not. Every person in the general population could be described along each of the three dimensions of overt behaviour viz. subjective symptomatology, objective clinical corroborative findings and objective physiological responses. At present conventional practice labels patients with the Irritable Bowel Syndrome as qualitatively distinct whereas in clinical reality it is not possible to make this categorical distinction.

3. There is a genetic predisposition to neuroticism

which predisposes to the Irritable Bowel Syndrome. A familial tendency for the Irritable Bowel Syndrome has been noted previously - [7]. In studies of recurrent abdominal pain in childhood, it has been shown that 67% of the parents and 50% of the siblings of such children had recurrent abdominal pain - [203, 204, 208]. This is often cited as evidence for genetic contributions to the Irritable Bowel Syndrome although they are equally consistent with the importance of the early environmental influence of modelling by parents and siblings. In fact, children of subjects with a history of an Irritable Bowel Syndrome in childhood do not suffer from abdominal pain any more frequently than children of persons without the Irritable Bowel Syndrome of childhood - [202]. The data suggest that actual exposure to a parent with symptoms is more closely related to the occurrence of symptoms in children than is the history of a parent's symptoms, a fact corroborating the importance of this learning experience - [202]. Since there is a great deal of evidence to support the concept of a genetic contribution to neuroticism and given the overlap which exists between neuroticism and the Irritable Bowel Syndrome, the behavioural model is a particularly suitable model in helping to explain many of the anomalies of the Irritable Bowel Syndrome.

ILLNESS BEHAVIOUR, LIFE EVENTS AND PSYCHIATRIC ILLNESS - A CATASTROPHE MODEL OF THE IRRITABLE BOWEL SYNDROME

Approximately one third of normal subjects experience symptoms compatible with a functional disorder of the gastro-intestinal tract yet only a quarter of these individuals have sought medical advice - [36]. Since patients who seek medical advice most often do so for problems that are common in the population but which frequently go untreated, the presence of the problem itself is not an adequate explanation for the patient's complaints. The probability that such subjects will request a medical consultation is increased by stress - [38, 41, 42]. Whilst stress is an undoubted factor triggering the request for consultation, it may also play a more direct role in precipitating the symptoms of illness as well. The factors which influence the propensity of a patient to seek medical advice when under stress include not just the severity of symptomatology but situational, social and cultural factors in addition to previous experience of illness and prior upbringing - [18, 40, 41, 42].

Three major questions remain unanswered.

1. Why do some subjects develop the Irritable Bowel Syndrome while others do not?
2. What factors control the choice of symptoms experienced?
3. What factors precipitate the onset of symptoms and influence the necessity to seek medical advice?

The Irritable Bowel Syndrome can be seen as a behavioural problem in which the unadaptive behaviour consists of what the patient says, what he does and how he responds physiologically in certain circumstances. The implication is that physiological responses result in the development of bowel symptoms as an unlearned response to stressful situations. As patients, they differ from other neurotic individuals in their overt symptomatic behaviour; these differences probably result from idiosyncratic learning experiences - [173]. There are several possibilities which may explain how previous learning experiences might dictate the choice of symptoms. By childhood exposure to parents or siblings with bowel symptoms the patient may have adopted misconceptions about normal bowel habits and may have learned that the symptoms of the Irritable Bowel Syndrome are socially acceptable ways of avoiding unpleasant responsibilities, eliciting concern and affection and signalling personal distress. Patients with the Irritable Bowel Syndrome may recognise they have a problem but find it easier to present to the doctor a medical problem rather than a psychological problem. This concept is often clinically apparent and is supported by the finding that patients with the Irritable Bowel Syndrome do not volunteer a history of previous psychiatric illness as often as other subjects in the general population - [207]. They therefore present themselves in a way that contributes to the doctor's failure to recognise the underlying psychological problem - [22].

In addition to these factors the patient's degree of extroversion also influences the tendency to report symptoms. The extroversion scores of patients with the Irritable Bowel Syndrome have been found to fall midway between those of neurotic and normal subjects - 156, 159. Patients complaining of pain also have elevated neuroticism scores and those with higher extroversion scores are more likely to make complaints precipitating the prescription of analgesics than those with lower extroversion scores - 26. The adoption of the Irritable Bowel Syndrome as an illness is in effect the adoption of the sick role in terms of illness behaviour and is a socially more acceptable mode of presenting distress. Previous personal illness experience and observed and unlearned illness behaviour in childhood are likely to be the principal controlling factors in symptom choice - 173.

The interaction between stressful life events and illness is complex but has been conceptualized using a linear model in which the pathway along which environmental stresses must travel to stimulate the subject's illness report is modified by a number of factors including past experience, psychological defences and reactions, coping mechanisms and illness behaviour. This model is analogous to the effects observed when a beam of light is subjected to a number of optical lenses and filters - 209. Figure 1. Human behaviour however is rarely so straightforward or predictable. An alternative view is that stressful life events are catalysts which

precipitate the symptomatic state in susceptible individuals and stimulate patients to seek medical advice. This sudden discontinuous alteration does not fit readily into a linear model but falls naturally instead into the realms of catastrophe theory using either the cusp or butterfly catastrophe models - [210 - 212].

Catastrophe theory as first proposed by Rene Thom showed that all graphs could be discussed in terms of 7 basic shapes called elementary catastrophes. Zeeman introduced the idea that psychological concepts could be succinctly illustrated using the geometrical approach of catastrophe theory. Given the sudden transition experienced by susceptible individuals who develop the symptomatic state of the Irritable Bowel Syndrome, the principal determinants are likely to be the level of neuroticism, the severity of symptomatology and the degree of contextual threat of stressful life events. These three axes are only partially independent but would allow the Irritable Bowel patient to be traced on a graph along three dimensions. At a certain point in the curve a sudden change or discontinuity would occur at which point the onset of symptoms could be viewed as a catastrophe necessitating medical advice. A catastrophe theory model of the Irritable Bowel Syndrome might explain the patient's own description of their illness which though apparently incomprehensible appears quite logical when viewed in the framework of a catastrophe surface - Figure 2.

The role of physicians may be very important in determining the health care projectory of the Irritable Bowel patient. A patient reporting the presence of certain symptoms or experiences in an unbiased way may be influenced by the focus of interest of the physician. Once medical intervention occurs, the tendency to identify behaviour as illness may play a large part in determining outcome. A person with recurring constipation and abdominal pain may believe the problem is related to ongoing marital problems but may want to make sure there is nothing more serious. If the physician becomes concerned and undertakes investigations to establish the diagnosis the patient may become convinced that there is an illness and become increasingly alarmed when symptoms persist. Since the original stressful situation has not been altered the effects of treatment will be temporary. At this point both doctor and patient then begin to question the diagnosis. The patient, now convinced that there is an illness, may lose confidence in the doctor who no longer seems sure about its pathogenesis or treatment. There then may follow a change of doctors, conflicting advice and progressive disability. If however, the patient is seen by a physician who discovers the marital problems and reassures the patient that his or her symptoms are of no ominous significance, then the outcome may be entirely different. Whether or not the marital problems are successfully dealt with, the gastro-intestinal symptoms take on a different significance.

Although a behavioural model does not dictate the necessity for behaviour therapy in every case of the Irritable Bowel Syndrome, it does have implications in the establishment of the therapeutic objectives. Behaviour therapists generally regard themselves as applying learning principles for the purpose of changing learned unadaptive behaviour - [173]. If the symptomatic change in bowel habits is an unlearned response to stressful circumstances, is it more appropriate to direct therapy at the altered bowel habits in an effort to uncouple this response from stressful stimuli or to teach patients that bowel symptoms are a normal response to stress and so direct therapy at reducing stress? The latter approach would appear to be the more appropriate and often the only realistic objective. However both approaches have quite different outcome implications. Following the first approach the goal is complete elimination of the symptoms. In the second approach a change in bowel habit would be expected from time to time with changing life circumstances since the elimination of all stress is impossible. The first approach with its goal of complete elimination of symptoms is usually what patients most desire and has been the stimulus to a combined behavioural and medical approach to therapy. Before accepting that nothing further can be done, therapy should first be directed at aspects of behaviour which are most susceptible to change. Thereafter, an attempt to help the patient to come to terms with the problem is the more appropriate therapeutic objective.

FUNCTIONAL DISORDERS OF THE ALIMENTARY TRACT

METHODOLOGY

INDEX

STUDY AIMS

1. Define the prevalence, nature and severity of gastro-intestinal symptoms in patients presenting to their general practitioner.

2. Determine the nature and severity of gastro-intestinal symptoms in patients referred by their G.P. to a hospital gastro-intestinal clinic.

3. Assess the frequency and severity of psychiatric symptoms in patients attending their G.P. and patients referred by their G.P. to a hospital gastro-intestinal clinic.

4. Assess the correlation between gastro-intestinal symptoms and psychiatric symptoms in patients attending their G.P. and patients referred by their G.P. to a hospital gastro-intestinal clinic.

5. Determine the frequency and severity of alcoholism in patients attending their G.P. and patients referred by their G.P. to a hospital gastro-intestinal clinic.

6. Correlate the symptoms of gastro-intestinal disorders and alcoholism in patients attending their G.P. and patients referred by their G.P.to a hospital gastro-intestinal clinic.

7. Determine the frequency and significance of stressful life situations and psychiatric symptoms during the previous six months in patients referred by their G.P. to a hospital gastro-intestinal clinic.

8. Correlate the nature and severity of stressful life situations and psychiatric illness prior to hospital referral with the final diagnoses in patients referred by their G.P. to a hospital gastro-intestinal clinic.

STUDY GROUPS

1. General practice population. During the three month period November 1982 - January 1983 patients attending a local single handed part-time general practitioner were invited to complete three detailed questionaires. 100 females and 50 males aged between 18 and 60 years were to be recruited and all resided in the district of Livingston on the outskirts of the city of Edinburgh.

2. Hospital gastro-intestinal clinic population. During the three month period November 1982 - January 1983, out-patients aged between 18 and 60 years and living within the city of Edinburgh who hadbeen referred by their general practitioner to a hospital gastro-intestinal clinic were to be recruited and invited to participate in a study involving detailed questionnaires and a domiciliary interview.

3. Community population. Using the electoral register, subjects living within Edinburgh and not seeking health care had previously been interviewed by trained staff from the Edinburgh M.R.C. Unit for Epidemiological Studies in Psychiatry. From this cohort of subjects in a normal population, individuals would later be selected to match hospital out-patients with respect to age, sex and socio-economic status. These normal subjects were to provide control data on the natural prevalence and severity of psychiatric illness and stressful life events.

ETHICAL CONSIDERATIONS

Details of the study, the questionnaires and the subsequent domiciliary interviews were reviewed by the Hospital Ethical Committee and formal approval was given. The normal codes of strict medical confidentiality were observed and the informed and written consent of the hospital clinic population was obtained. Individual general practitioners were contacted by telephone and their approval obtained before patients were interviewed in their home. Confidentiality was maintained throughout by the deletion of patients' names and addresses from the questionnaires and interview data sheets.

PATIENT SELECTION

General practice population. Patients attending a local single-handed part-time general practitioner (F.N.) were recruited. Individuals aged between 18 and 60 years were identified by the practice receptionist outwith periods of peak attendances in order to minimise the waiting time within the surgery. Patients were recruited on Monday, Wednesday and Thursday afternoons and on Tuesday and Friday mornings. At least 100 females and 50 males were to be admitted consecutively into the study to avoid biased selection.

Hospital gastro-intestinal clinic population. Only patients aged between 18 and 60 years referred by their general practitioner to the hospital gastro-intestinal clinic were recruited. The new patient clinics were conducted on Monday and Tuesday mornings by 3 Consultant Gastro-enterologists. Without biased selection and blind to the diagnosis, patients were intercepted following the initial consultation so that at least 75% of each consultant's referrals within the age group defined could be recruited. During the 12 week study period, 36 consecutive clinics provided the input to the hospital out-patient population. Following completion of the three questionnaires, patients were invited to participate in a further interview conducted at the patient's home. The basis of selection for the domiciliary interview was dependent solely on whether the patient resided within the city boundaries and whether the interview could be conducted within 12 weeks from the date of the general practitioner's referral letter.

Each week, at least six patients fulfilling these criteria were interviewed by trained staff from the Edinburgh M.R.C. Unit for Epidemiological Studies in Psychiatry who were blind to the clinical diagnosis. Using control subjects previously identified from the electoral register, individuals matched with respect to age, sex and socio-economic status were identified in order to facilitate a comparison with the hospital clinic group in respect of psychiatric illnesses, life events and difficulties.

PATIENT INTERVIEWS

The Questionnaire interview

General practice population. Each patient recruited from general practice was asked to complete the three questionnaires without assistance, recording only gastro-intestinal symptoms that had been experienced over the preceding 6 months. Patients were informed that the data collected was confidential and would be used to compare their symptoms with those experienced by hospital clinic patients. Details of the patient's age, sex, marital and occupational status were then recorded by the general practitioner together with the clinical diagnosis which precipitated the request for the general practitioner consultation. The questionnaire was then checked by the general practitioner to identify any questions the answers to which had been omitted. Additional explanations were given in such instances and the questionnaire completed by the patient at this initial interview.

The hospital gastro-intestinal clinic. Each patient emerging from the consulting room was approached and invited to complete the three questionnaires recording only gastro-intestinal symptoms that had been experienced during the preceding 6 months. The confidential nature of the questionnaire was explained to the patient together with the overall aims of the study. Following completion of the questionnaires, each questionnaire was then checked in order to ensure satisfactory completion

and where necessary further elucidation of symptoms was made and the answers sought from the patient. Details of the patient's age, sex, marital and occupational status were recorded. Patients living within the city boundaries who could be interviewed within 12 weeks of the referral date on the general practitioner's letter were then invited to co-operate in the second limb of the study. The patients were informed that the aim of the study was to record all the life events and difficulties in their personal, social and professional lives during the six months prior to referral so that the relationship between stress and illness could be examined. The confidentiality of this data was carefully explained and then with their written consent, details of their home address and telephone number were obtained. At the end of each 4 hour hospital clinic, consultants were asked to state their provisional diagnosis for each of the patients included in the survey. The date of hospital referral from the general practitioner's letter and the name of the general practitioner was recorded together with details from the referral letter of the presence or absence of information of a psycho-social nature which the general practitioner considered relevant to include.

The domiciliary interview. Prior to the domiciliary contact of hospital out-patients, general practitioners were notified by telephone of the nature of the study and asked for their verbal permission to proceed with the domiciliary interview. Each patient was contacted either by telephone or by home visit so that a suitable

time could be arranged for an interview to be undertaken within the 12 week period commencing from the date of hospital referral. Patients were informed that the interview would take approximately 2 hours and would be conducted by one of three trained female members of staff from the Edinburgh M.R.C. Unit for Epidemiological Studies in Psychiatry. The female interviewers had previously been trained in interview techniques and during the previous three years had regularly performed domiciliary interviews in the course of studies examining the relationship between stressful life situations and psychiatric illness in the community.

During the interview, a detailed inventory of the life events and difficulties occurring in the six months prior to interview was obtained. Using a structured questionnaire and portable tape recorder, detailed psychiatric assessments of the patients were undertaken, spanning the same time period. This tape recorded interview was subsequently analysed by a Consultant Psychiatrist in order to resolve any difficulties in classification which might arise in patients with borderline psychiatric illness. The information obtained by the domiciliary interviewers was to provide the necessary data to examine the influence of psychiatric illness on life events and difficulties and to establish an index of psychiatric "caseness".

THE CLINICAL QUESTIONNAIRE (Appendix I)

The facing page of the questionnaire was completed by the interviewer (general practitioner or hospital doctor) with the assistance of the patient. The date of hospital attendance, hospital unit number, study number, age and sex of the patient were recorded and marital status ascertained (single, married, divorced, separated or widowed).

Occupational classifications. Social and economic status have conventionally and conveniently been summarised using one of two separate classification structures viz. social class and socio-economic group - [213]. In order to facilitate the matching of patients and in recognition of the relatively small numbers of patients involved, the social class grouping was adopted. The classification of social class followed the same general lines adopted in population censuses prior to 1961 - [213].

Social classes

1. Professional and higher managerial occupations
2. Intermediate occupations
3. Skilled occupations (N) non-manual, (M) manual
4. Semi-skilled occupations
5. Unskilled occupations

These subgroups are relatively homogeneous in respect of the general standing of the occupations concerned within the community. In general terms the classification identifies groups of individuals whose social, cultural and recreational standards are similar despite differences in financial income. As is customary

females were classified with respect to the husband's, or if single, the father's occupation. Persons of the status of foreman whose basic social class was 4 or 5 were allotted to social class 3 and persons of managerial status whose basic social class was 4 or 5 were allocated to either social class 2 or 3 - [213].

The clinical diagnoses and duration of symptoms

On the day of attendance at the general practitioner or hospital clinic, the patient was asked how many weeks, months or years they had had the symptoms for which they were seeking advice. This data was recorded together with the provisional diagnosis suspected by the Consulting Physician or General Practitioner. In the hospital clinic group, the final diagnosis was also subsequently recorded after an interval of at least 12 weeks following the initial consultation. The investigations required to confirm the diagnosis were restropectively recorded from the case records. In addition the referral letter to the hospital clinic was reviewed and a record made when the referring general practitioner had considered psychological factors were significantly contributing to the patient's illness. In the general practice group, the number of appointments during the previous six months in respect of similar symptoms was recorded. Since all subjects in the hospital clinic group were recruited at their first out-patient appointment, the answer to this question was uniformly nil.

Questions concerning abdominal symptoms (Appendix I)

The questionnaire was self-administered and completed by patients at the time of initial attendance at the hospital clinic or general practitioner surgery. Only symptoms experienced within the previous six months were to be recorded and this point was stressed to each patient before commencing the questionnaire. On completion of the questionnaire items, the questions, the answers to which had been omitted, were explained to the patient and then completed in order to ensure that every question had been answered.

Symptoms referrable to the upper and lower alimentary tract were recorded in the answers to questions 2 - 25 and scored 0 - 4. These symptoms had previously been shown to be of discriminant value in the differential diagnosis of abdominal pain - 12, 36, 43, 49, 52, 55, 56, 59, 63, 71, 78, 144, 214, 215. Symptoms of urinary dysfunction were recorded in view of their apparent association with functional disorders of the alimentary tract - 63. The average number of bowel motions per week over the previous six months was recorded. Recall of bowel habit is often imperfect but in general, calendar records of bowel habit correlate well with recalled estimates of defaecation frequency in the majority of patients - 214. In addition a record was also made of the use of laxatives, the intake of a breakfast high in cereal roughage, allergic disorders, the relationship of symptoms to nervous disorders, the disruption of daily activities by troublesome symptoms and regular cigarette smoking.

PSYCHO-NEUROTIC - PROFILE QUESTIONNAIRE (Appendix II)

The initial task was the selection of a suitable screening questionnaire which could usefully compare groups of subjects with respect to their personality and psychoneurotic profiles - [216]. Ideally, the chosen test would form the basis of a screening test for psychiatric illness. The variation in sensitivity and specificity of such screening tests however affects their predictive value and the predictive value is dependent on the prevalence of psychiatric illness in the population under study - [217]. No reliable rapid test to establish psychiatric status has yet been produced which does not also require validation by an additional psychiatric interview. When self-administered questionnaires are used therefore, it is generally more useful to compare the frequency and severity of psychiatric symptoms in the different subgroups rather than to specify a cut-off point which identifies psychiatric "caseness" by severity - [217 - 220]. Accordingly the Middlesex Hospital Questionnaire (Crown-Crisp Experiential Index) was chosen as the most suitable screening method - [157 - 158].

The Crown-Crisp Experiential Index (CCEI) was designed to produce an objective, reliable and valid approximation to the diagnostic information that could be gained from a formal psychiatric interview. It consists of a 48 item questionnaire which provides a method of scoring six subscales, which include free floating anxiety, phobic anxiety, obsessionality, somatic anxiety, depression and hysteria. The scoring of the total CCEI and the 6 sub-

scale dimensions are as follows: the maximum score for each sub-scale is 16 and for the total CCEI is 96. The total CCEI score (questions 1 - 48) reflects the general level of neuroticism.

Free floating anxiety (FFA) (questions 1,7,13,19,25,31,37,43) reflects anxiety without a discernable cause.

Phobic anxiety (PHO) (questions 2,8,14,20,26,32,38 and 44) reflects anxiety in specific situations which if avoided is not experienced.

Obsessionality (OBS) (questions 3,9,15,21,27,33,39 and 45) reflects excessive adherence to routine and dislike of change or uncertainty.

Somatic anxiety (SOM) (questions 4,10,16,22,28,34,40 and 46) reflects the physical symptoms of anxiety.

Depression (DEP) (questions 5,11,17,23,29,35,41 and 47) reflects sadness of mood and retardation of thought and activity.

Hysteria (HYS) (questions 6,12,18,24,30,36,42 and 48) reflects shallowness of emotions, over-dependence, sociability and impulsiveness.

In quantifying the psycho-neurotic profile, there is considerable over-lap between symptoms (something the patient complains of) and traits (an attribute of personality). Hence in some instances, the 6 subscales may be both symptoms and traits. Previous studies have confirmed the reliability and validity of the CCEI in the general population, in general practice populations and

in populations of psychiatrically ill patients - [158]. Similarities in the distribution of CCEI scores in suburban and rural populations support the relevance of the CCEI in screening surveys. Comparative studies have also confirmed that in general, higher mean CCEI scores are recorded in females, social classes 4 and 5 and in less intelligent subjects - [158].

The CCEI 48 item questionnaire was completed by the two study groups, hospital out-patients and general practice attenders and scored as described. Each item scores a maximum of 2 points, each sub scale, a maximum of 16 points and the total CCEI, a maximum of 96 points. The questionnaires were complete in all instances since items which had been omitted had been drawn to the patient's attention and completed at the initial interview.

PRESENT MENTAL STATE ASSESSMENT

The current mental state was assessed over the 4 weeks prior to attendance at the general practitioner surgery or hospital out-patient clinic by asking patients to consider how they had been feeling during the previous month with respect to two symptoms, anxiety and depression. Using a vertical, linear analogue scale, this feeling was recorded as follows -

Anxiety

1. I never worry about anything
2. I get a bit worried occasionally
3. I often get worried about things
4. I tend to worry a great deal
5. I am always in a state of terrible worry and anxiety

Depression

1. I never feel unhappy
2. I sometimes feel a bit unhappy
3. I am quite often in low spirits
4. I frequently feel very miserable
5. I always feel very miserable and depressed

According to the answers, patients were scored 1 - 5. The method has been previously validated using the same 5 questions on a horizontal linear analogue scale 1 - 20 - 40, 219, 220. This method enables a comparison of the frequency distribution of severity of mood disturbance in the various sub groups of patients, and avoids the need for an arbitrary cut-off at a level of severity at which the presence of psychiatric illness could be inferred - 219.

ALCOHOLISM SCREENING QUESTIONNAIRE (Appendix III)

The close association of alcoholism and gastro-intestinal and psychiatric disorders is well recognised - [145] and [146]. In order to assess the prevalence of alcoholism in the study groups and to assess the potential influence of alcoholism on psychiatric and gastro-intestinal symptoms, a suitable screening tests was employed. The superiority and reliability of screening questionnaires compared with biochemical markers has been previously assessed and validated using a number of different techniques - [221 -223]. The Michigan Alcoholism Screening Test (MAST) was chosen because it is reliable and has stood the test of time. MAST, a 24 item questionnaire, is self-administered and scored using a differential weighting of items from 1 - 5. Total scores of 5 or more closely correlate with previous serious alcohol misuse,lifetime daily average comsumption and duration of problem drinking. It therefore provides a useful assessment of the severity of previous alcohol misuse along a continuum of scores 0 - 53 [224 - 227]. Using the cut off point of 5 or greater, MAST will correctly identify approximately 87% of problem drinkers and 87% of non alcoholics; the false positive and false negatives rates both average 13% approximately - [225 -227]. The MAST questionnaire was completed by all patients in the study groups, checked to ensure satisfactory completion and scored in the conventional manner.

PSYCHIATRIC ASSESSMENT SCHEDULE (PAS)(Appendix IV)

In recognition of the intimate association between stressful life events, long term difficulties and psychiatric state, a detailed record was made of the presence and severity of psychiatric symptoms present during the six months prior to interview. By recording the date of onset and duration of psychiatric symptoms during this six month period, life events and long term difficulties could then be related to current psychiatric symptomatology - [185]. No single set of definitions is universal in defining psychiatric "caseness". The concepts of a "case" are invariably based on the severe disorders commonly seen in psychiatric practice. The boundaries of these concepts have gradually become better defined and the rules of diagnosis more specific so that it is now possible to use a glossary of syndrome-based definitions that are universally accepted -[218, 228 - 231]. The principal psychiatric measurement used in the domiciliary interview was a modification of the Present State Examination (PSE) - [228, 232, 233]. The Present State Examination is an enquiry into psychiatric symptoms experienced during the previous month. This examination was modified to cover the six months prior to the date of domiciliary interview so that given a maximum delay of three months between the general practitioners' referral and the domiciliary interview, the psychiatric examination would cover at least a three month period prior to hospital referral. This modification was necessary in order to obtain details of the onset of any psychiatric disorder during the same period covered by

the inventory of stressful life events and long term difficulties. This modified Present State Examination, the Psychiatric Assessment Schedule (PAS), is detailed in full in Appendix IV. The interviewer introduced herself briefly and described the purpose of the interview and the necessity to make a tape recording of this component of the interview. As part of the introductory process details of the patient's marital - cohabitation status and occupational status were made including the occupational status of the husband if married, ex-husband if no longer married and father if an unmarried female. The interviewer then asked the patient to consider how they had been feeling during the past month and recorded the present mental state with respect to the two 5 point scales of anxiety and depression on a horizontal linear analogue scale 0 - 20.

The Psychiatric Assessment Schedule comprises four groups of questions:-

1. Obligatory questions - 54 obligatory questions to be asked of all patients. Patients with no symptoms could therefore be screened quickly.
2. Bracketed questions above cut-off points.
These questions assisted the definition of the nature and extent of the symptoms whenever there was any doubt about a reply to an obligatory question.
3. Unbracketed questions below cut-off points.

If the interviewer proceeded below a cut-off point, all the unbracketed questions in that section were

asked.

4. Bracketed questions below cut-off points.

Like similar questions above cut-off points, they defined the nature and extent of the symptom and were used only when there was other evidence that a symptom was present.

Symptoms are defined to some extent with the Schedule itself which contains accurate guidelines governing the method of scoring and the differentiation between scores 0,1 and 2. Separate codes were used to record when the interviewer was satisfied that the symptom was absent, when the interviewer was unsure whether the symptom was present or absent and when the patient would not or could not make a comprehensible answer to the question.

The Psychiatric Assessment Schedule differs from the Present State Examination in that it is solely concerned with psycho-neurotic disorders and excludes the characterisation of patients with major psychoses. In all other respects, however, the Psychiatric Assessment Schedule closely follows the question content and format of the Present State Examination. Details of the scoring of symptoms are recorded in the manual of the Psychiatric Assessment Schedule. (Appendix IV). There are two major decision points in the scoring system (0,1,2) for all symptoms. The first is whether or not the symptom is present and the second is whether it is present in a moderate or severe form. The differentiation between the presence or absence of symptoms can be difficult and three guidelines have been

used throughout in order to assist this categorisation.

1. The symptom is beyond conscious control, e.g. the subject cannot stop worrying or cannot abort a panic attack. When doubt exists, it is useful to note whether the subject can be distracted from worry or depression either by others or by himself, e.g. by turning his attention to another activity.

2. The symptom is disproportionate to the circumstances. This criterion is useful when the subject is worrying about trivia and when there are few significant environmental problems, e.g. a difficult marriage or financial problems.

3. The symptom is accompanied by an unpleasant affect. This is a useful criterion in acute conditions but in a chronic condition the affective component may become blunted. Similarly this criterion fails to apply when the subject is in a euphoric or elated mood.

Once it has been decided that a neurotic symptom is present the scoring of severity (score 1 or score 2) is a reflection of the frequency and intensity of the symptom. The obligatory questions can be grouped under 4 headings: depressive disorder, generalised anxiety disorder, phobic anxiety disorder and obsessional disorder. The dates of onset and remission of these key obligatory symptoms are recorded with the help of a calendar. When the subject has experienced more than one psychiatric episode during the six month period, a record is made of the onset and offset of each episode. "Caseness" was established along conventional lines using the Research Diagnostic Criteria (R.D.C.) and the Index of Definition criteria

(I.D.) - [218, 228, 231]. Using the same I.D. and R.D.C. criteria, details of the timing and severity of psychiatric symptoms experienced in the distant past were also recorded so that both a past and present psychiatric diagnosis could be formulated. A taped record of the entire Psychiatric Assessment Schedule was taken during each interview. In subjects whose score was borderline, a Consultant Psychiatrist (J.E.) listened to the tape in order to make an independent assessment of the "caseness" or otherwise of such subjects.

LIFE EVENTS AND DIFFICULTIES

The concept that psycho-social stress may be instrumental in precipitating the symptomatic state of physical disease has gained increasing popularity. In general, early studies, influenced by psycho-analytical concepts, were descriptive. Holmes and Rahe attempted to put life event research on a surer footing by developing life event questionnaires - [179, 234]. The Schedule of Recent Experience (SRE) has been the most commonly-used instrument in the assessment of stressful life events. In its original form it was used to elicit a score based on the number of recalled events occurring over a defined period of time. In order to measure the relative amounts of personal adjustment required to accommodate life events, the magnitude of re-adjustment termed the Social Re-Adjustment Rating Scale was introduced to achieve a total score expressed as life change units - [179, 234]. Since then, factor analysis has identified 6 distinct clusters of life event changes, viz personal and social activities, Work changes, Marital problems,

Residence changes, Family issues and School changes. In most situations, the use of a differential weighting of life events is unnecessary as a simple count of life event changes yields composite scores that correlate closely with weighted scores - [235]. The methodology, however, has been criticised since the majority of studies have assessed life events retrospectively and have failed to identify the implication of a life event for individual subjects. In addition, it is impossible to exclude the possibility that psychiatric illness occurring in association with illness may have influenced not only the life event itself but also the reporting and recall of the life event - [185, 236].

In an attempt to overcome these problems, the Social Research Unit of Bedford College have developed a method of collecting and recording life events using a systematic interviewing technique - [185]. In this way, it has become possible to develop a rating of the "contextual threat" of an event which reflects the likely impact of an event on the person experiencing it. This method takes into account the context in which the event occurs, e.g. a woman having her fourth child while living in a two apartment flat would be rated as having a more threatening life event than a similar birth to a woman living in a six bedroom house supported by a husband in the highest income bracket. The development of the Bedford system has resolved the important distinction between a single experience, an event, and a more chronic situation, a long-term difficulty. The contextual

rating of a long-term threat can be further divided into loss and danger. The focus of an event is specified i.e. the person to whom it happened and the independence of an event evalued. The assessment of independence is based on whether or not the subject could have contributed to the causation of the event or difficulty and is designed to eliminate events which though associated with psychiatric illness result from rather than cause psychiatric illness. Exposure to stressful events alone is rarely a sufficient explanation for the onset of illness and other factors influence the impact of events. These mediating and vulnerability factors can be grouped into three broad categories; individual psychological attributes, characteristics of the stressful situations and characteristics of the social support available. Although it is possible that extreme life events can induce disability even in those who do not have social or personal difficulties, vulnerability alone cannot produce illness or psychiatric disorder.

LIFE EVENTS - DIFFICULTIES ASSESSMENT SCHEDULE (APPENDIX V)

The Edinburgh M.R.C. Unit for Epidemiological Studies in Psychiatry have adapted the Bedford Life Event System and developed a different assessment and categorisation of life situations (events and difficulties). Their analyses have identified six possible dimensions of events and difficulties namely - Loss (L), Threat (T), Anti-social act (A), Hopeless situation (H), Uncertainty of outcome (U) and Choice of action (C) - [237, 238]. The interview recording life events differs from the Bedford

system in that it is not tape-recorded but recorded in hand-written notes. Scoring for long term threat, short term threat, focus, objective severity of difficulty and general severity of difficulty is first performed by the interviewer and then independently assessed by another who later meets the interviewer to resolve any disagreements. As in the Bedford system, strict and detailed criteria are used to determine which situations may be accounted as events or difficulties and subsequently rated. In addition events and difficulties which fail to meet all the criteria but which are important enough to record are retained for analysis so that all events which, though not scoring on threat score significantly on the additional dimensions, can be assessed.

The scales Personal loss (L) and Threat (T) were obtained by modifying existing Bedford ratings. The situation was first classified as being either an event of marked or moderate threat (Scale 1 or 2) or a major difficulty (Scale 1,2 or 3). The situation is then rated either as a loss of personal contact, as a threat or as a combination of both characteristics. Four new rating categories were developed and intended to be contextual rather than self-reporting rating scales. All available information was assessed in this rating using the following guidelines for the additional dimensions: (A) How reasonable the behaviour was which had led up to the situation, (H) How much positive promise the situation might have had, (U) Whether the situation was

resolved and if so whether this was to the subject's advantage and (C) Whether the situation presented the subject with an important choice of action which might engender severe conflict in the average person - [237] - [238]. A number of rating categories were developed for each dimension and these categories were applied both to events and to long term difficulties. The events and difficulties of each subject interviewed were rated independently by the interviewer and another person (P.McC.M.) who then met and resolved disagreements. In the case of the first of the new scales termed anti-social act (A) an event or difficulty had arisen because of inappropriate or inadequate behaviour on the part of the subject and was narrowly defined as behaviour which had provoked the involvement of a law enforcing agency e.g. police or bailiffs. In the second of the new scales termed Hopeless situation (H) the absence of any promise in the near future was assessed as distinct from Threat or Personal loss. Events particularly likely to be recorded (H) are death and separations. Not all such situations score automatically, for instance, the loss of a chronically ill and elderly mother would not score in this category if the death subsequently allowed the subject to divert his or her attention to other issues. The third new scale labelled Uncertainty of outcome (U), differed from the other three new scales in that the rating was made from the perspective of the time of occurence rather than on the day of interview when the situation might already be resolving; e.g. nursing a sick relative would score more positively in this

category if the relative had a chronic illness rather than a terminal illness. The fourth category, Choice of action, (C), was defined as an event or difficulty which would present the average person in that situation with an important conflict of decisions.

The Scoring Method

Life events and difficulties were characterised on six dimensions, e.g. an event might be purely T if threat alone characterised it or A,H,U,T, if it scored as anti-social act, hopeless situation, uncertainty and threat. Many events and difficulties may not score on any of the six dimensions and would achieve zero characterisation. All the dependent events and difficulties precipitated by the subject and potentially the cause of anxiety or depression were identified by a dependence/independence scale of 0 or 1. Only independent events and difficulties (scale 1) were retained for analysis. The scoring methods were as follows:

1. The number of all events and difficulties was noted for use as a control method of scoring against which other methods could be tested.

2. The number of all events and difficulties containing at least one of the 6 characteristics (T,L,A,H,U, or C) was recorded.

3. The pattern of characteristics present in the more intense events and difficulties was recorded. Here the

concern was with the particular characteristics present. Previous research has shown which of the 64 possible combinations are likely to be particularly associated with disorders of anxiety and/or depression -[187,238]. Such anxiety provoking situations (severe events and major difficulties) were assessed using a differential scoring system as follows:

CHAT, CUHT, CHT, LH each scored 4.

CAT, CUT, UHT, CH, CL each scored 2.

CUA, UH, UA, CA each scored 1.

4. The total intensity across all events and difficulties was recorded as the count of the total number of characteristics present. E.g. a person having an event TU and a difficulty T L H U C would score 7.

LIFE EVENTS - DIFFICULTIES INVENTORY (APPENDIX V)

Patients were given a list of events and difficulties and asked to record which events and difficulties they had experienced in the six months prior to interview. Given a maximum delay of three months between the time of G.P. referral and the interview, the inventory would cover at least a three month period prior to hospital referral. All situations that had happened either to them personally or to people close to them were recorded. If an event or difficulty spanned more than one of the topics listed they were asked to record each topic whether or not it was the same event or difficulty involved. The interviewer then determined from the list whether the situation was an event, a difficulty or

neither. The date of onset and remission was recorded with the use of a calendar. Additional questions were asked in order to facilitate the recall of events and difficulties and to cue the patient in assisting this recall. Though the inventory was primarily concerned with situations arising within the previous six months, a record was also made of past traumas when these appeared of immediate relevance to a pre-existing psychiatric disorder.

Every effort was made to ensure that as far as possible all events and difficulties were recalled by the patient using the combination of lists of events and difficulties and questions designed to elicit covert experiences which otherwise might not readily be remembered. In addition the cueing effect of the psychiatric assessment schedule which had preceded this part of the domiciliary interview was a potent stimulus to the recall of events and difficulties over the same six month period. The three interviewers had been fully trained in the recording and assessment of life events and difficulties and during the previous three years had undertaken several hundred such interviews in their work at the Edinburgh M.R.C. Unit for Epidemiological Studies in Psychiatry. The reliability and validity of the Bedford life event-difficulty interview is now well established - [185, 237]. In any study employing a self-administered schedule of recent experience, the validity of recalled life situations is questionable particularly when the period under study is greater than six months in

the past - [239]. It should also be remembered that although high levels of reliability have been established for the number of events recalled, the reliability of the recall of very distressing events tends to be lower than for the less distressing events - [240 - 241].

Social support (Appendix VI)

Following the Psychiatric Assessment Schedule detailing the onset and remission of psychiatric symptoms during the preceding six months, patients were asked to record family members and friends together with people around them whom they saw from time to time. Contact with parents and siblings was carefully recorded together with the number and relationship of household members. Patients were asked to imagine that they had a personal crisis and to detail whom they would discuss such problems with and whom they would turn to in such distress. The frequency with which they met family members and close friends was recorded and coded as 0 = meeting the member less than once a week and 1 = meeting the member more than once a week. In addition sources of diffuse support with contacts on at least fortnightly basis were included e.g. sports clubs, church organisations, bingo clubs and pubs.

Previous studies have shown that the number of threatening life events and the prevalence of physical

and psychiatric symptoms is greater in subjects with few casual friends - [186, 242]. In consequence details of close and diffuse social support were recorded in the study group. Each subject provided information about the person whom they considered to be their best confidant and also told the interviewer about the number of more superficial acquaintances there were at work, among neighbours and relatives, among clubs and societies. The confidant was scored on a 2 point scale; a score of 1 was given if the confidant was somebody a) to whom the subject could tell everything, b) who was easily available and c) who reciprocated by telling the subject everything; a score of 0 was given if only one or no characteristics were present or if there was no confidant at all. Diffuse support was scored on a 2 point scale depending on how many superficial acquaintances there were, 0 representing little diffuse support and 1 representing easily identifiable sources of diffuse support.

General practitioner group. Following completion of the questionnaire the general practitioner completed the facing page of the questionnaire recording the patient's age, sex, marital status and occupational status as previously described. The duration of symptoms was coded in months. Patients with symptoms of less than one week duration were coded as (00) and patients with symptoms of between one and four weeks duration were coded as (01). The general practitioner recorded in one of ten mutually exclusive categories, the reason for the consultation as below:-

Trauma	Code 00
Respiratory symptoms	Code 01
Cardiovascular symptoms	Code 02
Alimentary symptoms	Code 03
Obstetric - genito-urinary symptoms	Code 04
Psychiatric symptoms	Code 05
Neurological symptoms	Code 06
Endocrinological symptoms	Code 07
Ophthalmic - E.N.T. symptoms	Code 08
Locomotor symptoms	Code 09
Dermatological symptoms	Code 10

All the patients were attending a single-handed part-time general practitioner and lived in the district of Livingston, a new town on the outskirts of Edinburgh. This practice population was considered particularly attractive since it had been the centre of extensive study by the Edinburgh M.R.C. Unit for Epidemiological Studies in Psychiatry over the preceding five years - [40],

Hospital gastro-intestinal clinic group. At the initial hospital consultation, following completion of the questionnaires, each patient was asked how long they had had the symptoms for which they had recently been referred to hospital. The duration of symptoms was coded as follows; symptoms of less than six months duration were coded as (00), symptoms of between six months and one year's duration were coded as (01) and symptoms of longer duration were coded to the nearest year e.g. (02), (03), (04) etc. Following each new patient clinic, a record was made of the consulting physician's provisional diagnosis. After a period of not less than twelve weeks a retrospective review of the medical case records of all patients admitted into the study was undertaken. The final diagnosis was recorded and an inventory made of all major investigations performed in order to establish the final diagnosis. This inventory comprised the results of investigations including barium x-ray studies, upper and lower alimentary endoscopy, oral cholecystography, ultrasound scans, urography, jejunal biopsy, liver biopsy and surgical operations.

The final diagnosis, considered to be the principal cause of the request for consultation, was recorded and coded into one of four mutually exclusive categories as follows. Functional bowel disorders = upper alimentary - code (01), lower alimentary (02) Organic bowel disorders = upper alimentary code (11), lower alimentary

code (12). For the purposes of coding, upper alimentary disorders included disorders of the oesophagus, stomach, duodenum, gall bladder, liver and pancreas; lower alimentary disorders included disorders of the small bowel, large bowel and genito-urinary tract. In addition, a review of the initial general practitioner referral letter was undertaken and a record made when the referring doctor had considered it relevant to include details concerning life situations and psychological disorders which might have had some bearing on the patient's illness.

COMPUTER ANALYSIS OF THE CLINICAL DATA AND STATISTICAL METHODS

Clinical symptomatology questionnaire (Appendix 1)

Using the facing page, the responses to the three questionnaires were recorded in numerical form and processed by the University Department of Medical Computing and Statistics on the mainframe computer ICL 2988. The EMAS operating system was used together with the standard statistical program BMDP - 243. The frequency of each symptom and its relationship to other symptoms was established and its significance was assessed by Chi-square analysis and analysis of variance. A sub-set of the major and independent variables was entered into a cluster analysis procedure in order to determine whether any of the sub-groups found were supported objectively by the questionnaire data. Cluster analysis is a mathematical technique based on measuring the similarity between pairs of individuals and

then grouping together those individuals whose similarity reaches a pre-determined level. No prior assumptions were made when the data was analysed as to whether or not the population studied was divisible into groups. The methodology also termed numerical taxonomy has been well described - [86, 244].

In the general practice population studied, a similar cluster analysis of gastro-intestinal symptoms was undertaken irrespective of GP diagnosis coding. In addition patients presenting to their general practitioner with psychiatric symptoms coded 05 and patients with alimentary symptoms coded 03 were identified as discrete sub-groups and compared in like manner to the remaining patients with alternative diagnosis codes. In this way the prevalence of clusters of symptoms could be analysed in a general practice population of patients seeking health care and in those patients specifically seeking health care with respect to psychiatric or gastro-intestinal disorders.

PSYCHO-NEUROTIC PROFILES (C.C.E.I.)

Hospital population. The total C.C.E.I. scores and the six sub-scale scores, F.F.A., P.H.O., O.B.S., S.O.M., D.E.P., and H.Y.S. were derived by simple addition as previously described and recorded on the facing page of the questionnaire. The frequency distribution of these scores in the two groups, Functional bowel disorders and Organic bowel disorders were compared with respect to age and sex using standard statistical methods - [158]. Data

from the initial questionnaire was transferred to punch cards and processed by an ICL 2988 mainframe computer at the Edinburgh Medical Computing and Statistics Centre.

General practice population. In like manner the total C.C.E.I. scores and sub-scale scores of the GP population studied were derived and processed. Comparisons of the frequency distribution of these scores with respect to age and sex were made in four groups as follows; the entire group irrespective of diagnosis code, the sub-group presenting with psychiatric symptoms coded 05, the sub-group presenting with alimentary symptoms coded 03 and the remaining patients with alternative codes. Using these methods and with the assistance of an ICL 2988 mainframe computer, it was possible to compare the hospital and general practice sub-groups.

Present mental state. The scoring method used to assess levels of anxiety and depression experienced in the month preceding the questionnaire employed a vertical linear analogue scale rated 1 - 5 for each of the two symptoms. A comparison of the frequency distribution of scores for anxiety and depression was made in the hospital group between patients with functional bowel disorders and organic bowel disorders. In the general practice group the comparison was as previously described between the four groups; the entire group irrespective of diagnosis code, patients coded as presenting with psychiatric symptoms, with alimentary symptoms, and the remainder with alternative codes. This additional data was also used to correlate the present mental state with C.C.E.I. scores together with an assessment of its relationship to

the two hospital sub-groups and four GP sub-groups.

ALCOHOL SCREENING QUESTIONNAIRE (M.A.S.T.)

The scoring method for the M.A.S.T. employed differential weighting of certain symptoms - [224]. Of the 25 original items, 4 items scored 5 points, 16 items scored 2 points and 4 items scored 1 point. In its original form, one item scored zero as it correlated poorly with problem drinking and this item was therefore excluded from the questionnaire - [225-226]. The total score on the M.A.S.T. was recorded in all patients and the scores were compared in the two hospital groups and the four GP groups by rank sum tests. In addition, patients scoring 5 points or more and considered to have or have had a significant alcohol problem were identified so that prevalence rates in the two hospital and three GP sub-groups could be compared using Chi square tests. Given a cut-off criterion of a score of 5 points or more, the presence or absence of an alcohol problem in both the hospital and GP groups was included in the analysis of gastro-intestinal symptoms so that any significant correlation with specific symptoms or groups of symptoms could be detected.

PSYCHIATRIC ASSESSMENT SCHEDULE

An index of "caseness" based on the number, type and severity of psychiatric symptoms was constructed in order to define a threshold point above which sufficient information was available to allow classification of clusters of psychiatric symptoms into a specific category of psycho-neurotic disorder - [218, 231]. Interviewers

made a global judgment as to whether there was a definite degree of "caseness", a borderline degree or whether the disorder was absent. Taped records of the psychiatric assessment were reviewed by a Consultant Psychiatrist when the situation was borderline. Interviewers recorded whether each symptom was absent (score 0), present to a moderate degree (score 1) or present to a severe degree (score 2). Patients could then be categorised into cases or non-cases using the PAS scoring both by the index of definition (ID) method of caseness and the research diagnostic criteria (RDC) method of caseness - 218, 234. The "index of definition" characterised not only the total number of psychiatric symptoms outlined in the PAS but also their type, severity and set combinations.

The degree of caseness can be described by at least FIVE LEVELS - using the PAS scores - 218.

Level 1 No psychiatric symptoms. score = 0

Level 2 Non specific symptoms scoring 1-4 in total

Level 3 Non specific symptoms scoring 5-9 in total

Level 4 Specific symptoms scoring 10 or more or the presence of a key specific symptom viz "borderline caseness"

Level 5 + Minimum or threshold basis for the diagnosis of overt psychiatric illness. The essence is the presence of two or more key specific affective symptoms of at least moderate severity - with a total score of 11 or more.

Using the RDC criteria, patients were allotted to one of seven, mutually exclusive diagnostic categories of

psychiatric illness on the basis of their responses in the PAS.

Category 0 - No psychiatric illness
1 - Major depressive disorder
2 - Probable major depressive disorder
3 - Minor depressive disorder
4 - Probable minor depressive disorder
5 - Panic disorder
6 - Probable panic disorder
7 - Generalised anxiety disorder

These methods provided a more valid external criterion in the assessment of patients whose psychiatric symptoms could otherwise only have been described by the C.C.E.I. and its sub-scale scores. In addition the recording of the onset and remission of psychiatric symptoms enabled an analysis of the potential inter-relationship of life events, difficulties and psychiatric illness.

LIFE EVENT - DIFFICULTY ASSESSMENT

Life events and difficulties were characterised in six different dimensions namely loss (L), threat (T), anti-social act (A), hopeless situation (H), uncertainty of outcome (U) and choice of action (C). The scoring methods have already been described earlier in the text. The number and severity of events and difficulties were recorded together with the presence or absence of the six dimensions of these events and difficulties. Events and difficulties considered dependent on the subject's action and likely to have been caused by the psychiatric symptoms recorded in the psychiatric assessment schedule

were removed from the analysis. This dependence rating was on a 2 point scale ranging from independent (1) to dependent (0). In addition, 4 further variables were assessed using multiple regression including social class, sex, close social support and diffuse social support. Close social support was scored on a 2 point scale; a score of 1 was given if there was somebody a) to whom the subject could tell everything, b) who was easily available, c) who reciprocated by telling the subject everything. A score of (0) was assigned if less than 2 characteristics were present. Diffuse social support was scored on an 2 point scale depending on how many superficial acquaintances there were, (0) representing very little diffuse support and (1) easily identifiable diffuse support.

Events and difficulties were analysed and a comparison made within the hospital group of patients with functional bowel disorders and patients with organic bowel disorders. Both the severity of life events and difficulties and their time of occurrence were compared. In addition, by comparison with matched controls, females with functional bowel disorders were assessed in respect of the relative frequency and severity of psychiatric episodes and stressful life situations together with an analysis of their inter-relationship and their possible association with the onset of bowel symptoms.

FUNCTIONAL DISORDERS OF THE ALIMENTARY TRACT

RESULTS

INDEX

THE G.P. POPULATION; Demographic Data

Table 1:

1. General Practice Population		Nos.	%
Patients in practice		1129	100%
Male/female		581/548	51/49
Single	0	578	51
Married	1	517	46
Divorced/separated	2	18	1.5
Widowed	3	16	1.5
Social class	I	24	2
	II	111	10
	III	632	56
	IV	281	25
	V	81	7
Nos. aged	0-11	244	22
	12-21	292	26
	22-31	187	16
	32-41	165	14
	42-51	143	13
	52-61	56	5
	62-71	24	2
	72+	18	2

TABLE 2:

The GP study group : Demographic data

Total population aged 18-60		n =	634	56% of practice
Total consultations (Nov. 1982 - Jan. 1983)		n =	792	
Total recruited to clinical questionnaire		n =	142	22% of all aged 18-60
Total declining questionnaire		n =	10	
			Nos.	%
Sex ratio		M =	42	30
		F =	100	70
Single			19	13
Married			109	77
Divorced/separated			13	9
Widowed			1	1
Social class	I		0	0
	II		3	2
	III		57	40
	IV		56	40
	V		26	18
Unemployed male			6	14
Unemployed husband			15	15
Age groups	18-29		52	37
	30-39		42	30
	40-49		29	20
	50-60		19	13
Mean age (± SEM)		34.8 ± 0.96		
Males (42)		35.8 ± 1.95		N.S.
Females (100)		34.4 ± 1.10		

Table 3

HOSPITAL GI CLINIC POPULATION (November 1982 - January 1983)

Demographic data

			Nos	%
Total nos. referred by GP			244	100
Total nos. aged 18-60 years			159	65
Total nos. recruited to clinical questionnaire aged 18-60 years			134	84
Nos. declining			5	
Nos. recruited/referred aged 18-60 to consultants A,B,C		A	27/30	90
		B	47/57	82
		C	60/72	83
Sex ratio		M	= 54	40
		F	= 80	60
Single			29	22
Married			90	67
Divorced/separated			12	9
Widowed			3	2
Social class	I		12	9
	II		30	22
	III		50	37
	IV		32	24
	V		10	8
Age groups	18-29		40	30
	30-39		42	31
	40-49		28	21
	50-60		24	18

Mean age (± SEM)	37.4 ± 1.02	
Males (54)	40.9 ± 1.55	t = 2.8
Females (80)	35.2 ± 1.29	P < 0.01

TABLE 4. DOMICILIARY INTERVIEW OF HOSPITAL GI REFERRALS

Demographic data

		Nos.	%
Total nos. aged 18-60 recruited		134	84%
Total nos. invited to co-operate with domiciliary interview		80	60
Total nos. interviewed		64	80
Nos. declining interview		10	
Nos. unable to be interviewed within 12 weeks of referral		6	
PATIENTS INTERVIEWED	M = 25 F = 39	46% of men 49% of women	
Mean age ± SEM	39.2 ± 1.44		
Age groups	18-29	16	25
	30-39	16	25
	40-49	17	27
	50-60	15	23
Social class	I	6	9
	II	22	34
	III	18	28
	IV	14	22
	V	4	7
Single		16	25
Married		42	66
Divorced/separated		4	6
Widowed		2	3

Table 5: HOSPITAL PATIENTS RECRUITED INTO THE STUDY

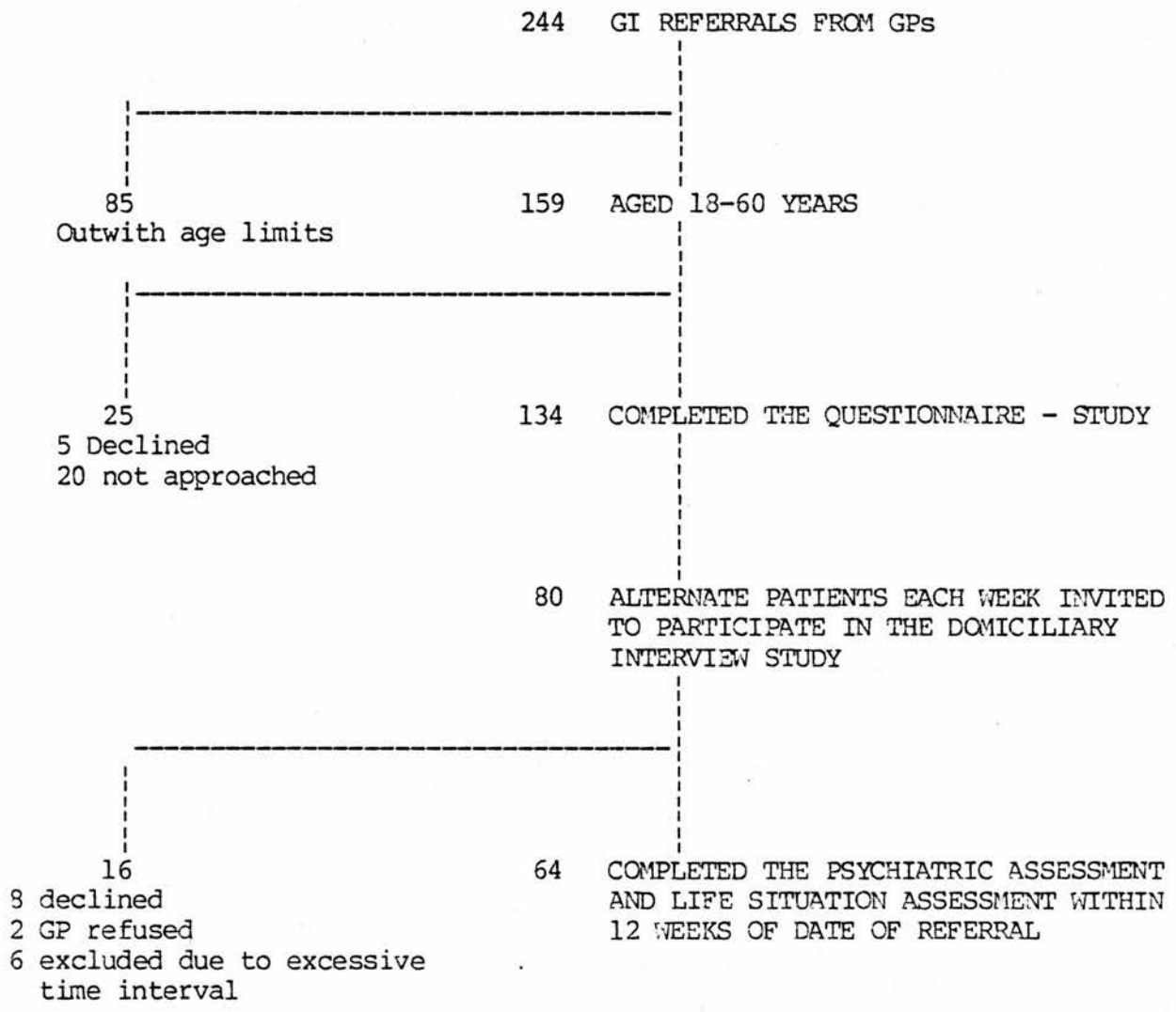

TABLE 6 : The diagnostic codes in general practice

		Total nos.	M.	F.	%
00	Trauma	9	7	2	6
01	Respiratory	11	4	7	8.5
02	Cardiovascular	9	3	6	6
03	Alimentary	14	4	10	10
04	Genitourinary	36	2	34	25
05	Psychiatric	19	1	18	13
06	Neurological	5	1	4	4
07	Endocrinological	9	2	7	6
08	Eyes/ENT	9	5	4	6
09	Locomotor	11	7	4	8.5
10	Dermatological	10	6	4	7

TABLE 7 : Unemployment the diagnostic groups in general practice

Diagnostic group	Sex		Unemployed Males		Age (Mean + SEM)
	Male	Female	Subject	Spouse	
Alimentary (14)	4	10	0	1	33.4 ± 3.1
Psychiatric (19)	1	18	0	2	37.3 ± 3.0
All others (109)	37	72	6	12	34.6 ± 1.11
TOTAL (142)	42	100	6	15	34.8 ± 0.96

Sex distribution: Chi square = 6.40, $p < 0.04$

Age: Analysis of variance $F = 0.6$, $p = 0.55$ (NS)

GENERAL PRACTICE POPULATION

Table 8 : Diagnosis V. Marital status

		Single	Married	Div/Sep/Widowed	Signif.
Alimentary	(14)	1	11	2	N.S.
Psychiatric	(19)	4	11	4	
All others	(109)	14	87	8	

Table 9 : Diagnosis V. Social class

		I	II	III	IV	V	Signif.
Alimentary	(14)	0	0	5	6	3	N.S.
Psychiatric	(19)	0	0	9	8	2	
All others	(109)	0	3	43	42	21	

Table 10 : Diagnosis V. Duration of symptoms (months)

	0-3	4-6	7-12	13-24	24+	Mean + SEM
Alimentary	11	0	1	1	1	6.5 ± 3.6
Psychiatric	13	2	1	2	1	8.0 ± 3.9
All others	68	5	11	3	22	17.5 ± 3.6

Using chi square analysis and Wilcoxon Rank Sum tests, no significant differences in marital status, social class or duration of symptoms was found between the three diagnostic groups. Similarly, the number of previous consultations in the last six months with the same symptoms was not significantly different between the three diagnostic groups.

Table 11 : Diagnosis V. Nos. of previous consultations (6/12)

	Nil	1-3	4+	Signi
Alimentary	1	10	3	
Psychiatric	1	12	6	N.S.
All others	8	67	34	

GENERAL PRACTICE POPULATION

GI SYMPTOMATOLOGY

Symptoms were analysed with respect to frequency of occurrence and considered of significance if experienced at least monthly during the previous six months.

Table 12 : Upper alimentary symptoms

Symptoms	(Question) (No.)	and their frequency of occurrence Nil/occas.	Monthly	Weekly	Daily	%
* Nausea	10	121	11	4	6	15
Anorexia	11	131	3	4	4	8
Vomiting	13	138	2	1	1	3
Acid reflux	14	129	5	2	6	9
* Globus	15	135	2	4	1	5
Heartburn	16	124	3	5	10	13
Belching	29	121	3	8	8	13

Chi square (nausea) 18.9, $p < 0.01$
Chi square (globus) 16.4, $p < 0.02$

* Nausea and globus were experienced significantly more frequently in patients with alimentary and psychiatric symptoms respectively. No other significant differences emerged between the three diagnostic groups and the above symptoms.

Table 13 : Diagnosis (Question No. 12) V. Weight loss (6/12)

	Nil	1-6 lb	7-14 lb
Alimentary	9	4	1
Psychiatric	8	9	2
All others	80	22	7

WRS & Chi square - N.S.

Table 14 : Diagnosis (Question No. 10) V. Nausea

	Nil/occas.	Monthly	Weekly	Daily
Alimentary	8	1	2	3
Psychiatric	17	1	0	1
All others	96	9	2	2

Chi square = 18.9, $p < 0.01$

Table 15 : Diagnosis (Question No. 15) V. Globus

	Nil/occas.	Monthly	Weekly	Daily
Alimentary	13	0	0	1
Psychiatric	16	1	2	0
All others	106	1	2	0

Chi square = 16.4, $p < 0.02$

GENERAL PRACTICE POPULATION

TABLE 16: Diagnosis (Question No. 16) V. Heartburn

	Nil/Occas.	Monthly	Weekly	Daily
Alimentary	12	0	0	2
Psychiatric	17	1	0	1
All others	95	2	5	7

WRS & Chi square - N.S.

GENERAL PRACTICE POPULATION

Lower alimentary symptoms

Table 17: Diagnosis (Question No. 17) v. Bowel frequency/week Mean (+ SEM)

G.I.	9.9 ± 1.9
Psychiatric	6.6 ± 0.6
All others	7.9 ± 0.4
Total GP Group	7.9 ± 0.4
Analysis of variance	F = 2.21, p = 0.113 (NS)

Table 18 : Diagnosis V. Bowel frequency

	0-2/week	3-6/week	1-2/day	3+/day
Alimentary	1	7	4	2
Psychiatric	0	17	2	0
All others	6	79	18	6
Total	7 (5%)	103 (72.5%)	24 (17%)	8 (5.5%)

WRS + Chi square = N.S.

Symptoms analysed with respect to frequency of occurrence over the previous six months are included in the table and considered to be significant if present at least once each month.

Table 19 : Symptoms

	Question No.	Nil/occas.	Monthly	Weekly	Daily	%
Mucus PR	18	137	2	0	3	4
Urgency of defaecation	19	134	1	3	4	6
Pellet/ribbon stools	20	135	1	2	4	5
Diarrhoea	21	136	2	1	3	4
Constipation	22	123	2	8	9	13
Tenesmus	23	131	2	2	7	8
Flatulence	31	134	2	4	2	6
Abdominal distension	32	112	11	6	13	21
Sleep disturbed by abdominal pain	33	136	2	2	2	4
Laxative use	34	138	1	1	2	3
Urinary urgency	36	116	1	8	17	18
Urinary frequency	37	115	13	3	11	19
Nocturia	38	117	3	3	19	18

No significant differences in these symptoms were found between the three diagnostic groups, alimentary, psychiatric and all others.

TABLE 20: Diagnosis (Question No. 24) V. Abdominal pain

	Nil/occas.	Monthly	Weekly	Daily
Alimentary	8	2	1	3
Psychiatric	14	2	1	2
All others	97	6	3	3
Total (142)	119 (83%)	10 (7%)	5 (3%)	8 (6%)

Chi square = 12.7, $p < 0.05$

Abdominal pain occurred significantly more often in the alimentary group compared with the others.
Total experiencing abdominal discomfort = 108 (76%).
Total experiencing pain at least monthly = 23 (16%).

TABLE 21 : Site of abdominal pain/discomfort (Question No. 25)

Upper abdomen	23	21%
Lower abdomen	67	62%
Right side	11	10
Left side	7	7%
Total	108	(34 never experienced pain)

TABLE 22 : Relationship between abdominal pain and bowel habit in 108 patients

	Question No.	Nil	Occas	Usually
Change by defaecation	26	28	39	41
Change by belching	30	58	29	21
Change by flatus PR	27	34	47	27
Pain coinciding with bowel change	28	64	32	12

No significant differences between the three diagnostic groups with respect to the relationship of abdominal pain and bowel habit were found.

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Table 23 : Diagnosis (Question No. 35) V. Breakfast roughage intake:

	Nil	Weekly	Daily
Alimentary	9	3	2
Psychiatric	15	1	3
All others	64	17	28
Total	88 (62%)	21 (15%)	33 (23%)

Chi square - N.S.

Table 24 : Diagnosis V. Allergic disorders (Question No. 39)

	Nil	Eczema	Rhinitis	Asthma
Alimentary	13	0	0	1
Psychiatric	16	2	1	0
All others	82	6	13	8
Total	111 (78%)	8 (6%)	14 (10%)	9 (6%)

Chi square - N.S.

Table 25 : Influence of 'nervousness' on abdominal symptoms

Diagnosis (Question No. 40)	No effect	Occas. affects	Usually affects
Alimentary	6	5	3
* Psychiatric	0	9	10
All others	46	42	21
Total (142)	52 (37%)	56 (39%)	34 (24%)

Chi square = 15.97, $p < 0.005$

* Worry and nervousness aggravated abdominal symptoms significantly more often in the psychiatric group compared with the rest.

Table 26 : Previous GP consultations with 'nerves' (Question No. 41)

Diagnosis	Nil	Occas. consulted	Often consulted
* Alimentary	8	6	0
Psychiatric	3	7	9
All others	75	31	3
Total (142)	86 (61%)	44 (31%)	12 (8%)

Chi square = 48.04, $p < 0.001$

* No significant difference between the alimentary group and non-psychiatric patients.

GENERAL PRACTICE POPULATION

TABLE 27 : Cancer phobia (Question No. 43)

Never	120	(85%)
Occasionally	21	(15%)
Often	1	

No significant differences were found between the three groups using the Wilcoxon Rank Sum test (WRS).

TABLE 28 : Diagnosis and Regular cigarette smoking (Question No. 44)

Alimentary	10		
Psychiatric	7		
All others	54		
Total	71	(50%)	Not significant (WRS)

TABLE 29 : Working days lost due to abdominal symptoms (Question No. 42)

Diagnosis	Nil/occas.	5-10 days	10-28 days	28+ days/year
Alimentary	13	0	1	0
Psychiatric	18	0	0	1
All others	103	1	2	3
Total	134 (94%)	1	3	4

No significant differences between the groups were found on WRS and Chi square analysis.

TABLE 30 : Diagnosis V. Current mental state (Linear analogue ratings 0-5)

Diagnosis	*Anxiety scale					**Depression scale				
	1	2	3	4	5	1	2	3	4	5
Alimentary	0	10	2	2	0	0	12	1	1	0
Psychiatric	0	5	3	9	2	0	8	9	1	1
All others	6	68	16	14	5	12	71	19	6	1
Total	6	83	21	25	7	12	91	29	8	2
Mean (± SEM)	2.60 ± 0.08					2.27 ± 0.06				

Psychiatric group scored significantly greater on both the anxiety and depression scales.

* Anxiety F = 1.05, p < 0.0004
Chi square 18.86, p < 0.02

** Depression Chi square 17.00, p < 0.05
F = 4.31, p = 0.015

GENERAL PRACTICE POPULATION

Table 31 : Mast alcoholism scores : Demographic Data

Diagnosis	Score 0	Score 0-4	Score 5+	
Alimentary (14)	5	12	2	
Psychiatric (19)	14	18	1	N.S.
All others (109)	69	94	15	
Total	88	124 (87%)	18 (13%)	
Males (14)		28	14	*
Females (74)		96	4	*
Unemployment (males)		1	5	**
Smokers		59	12	N.S.
Marital status				
Single		17	2	
Married		95	14	N.S.
Div/Sep/Widowed		12	2	
Social class				
I		0	o	
II		3	0	
III		51	6	N.S.
IV		50	6	
V		20	6	

* Chi square = 24.5, $p < 0.001$

** Chi square (Yates) = 5.5, $p < 0.02$

Alcoholism was significantly more frequent in males and in the unemployed.

No significant associations were found between alcohol scores 5+ and any of the alimentary symptoms detailed in the questionnaire.

GENERAL PRACTICE POPULATION

TABLE 32 : Cluster analysis of GI symptoms

Using the cluster analysis program, BMDP, on the ICL 2988 mainframe computer, a clustering of alimentary symptoms was obtained by the minimum distance method within a correlation matrix.

The standard error of the correlation coefficient 'r' = 0.084; a significance of $p < 0.01$ and $p < 0.001$ can be inferred given r values greater than 0.22 and 0.28 respectively.

Symptom clusters (Question Nos.)		Correlation coefficient
Qu. 10,13	Nausea and vomiting	r = 0.54
Qu. 18,19,21	Rectal mucus, urgency of defaecation and watery stools	r = 0.30 - 0.50
Qu. 14,29,42,33	Acid regurgitation, belching, time lost off work, nocturnal abdominal pain	r = 0.34 - 0.54
Qu. 36,37,38	Urinary urgency, frequency and nocturia	r = 0.51 - 0.58
Qu. 26,27,30	Abdominal pain changed by defaecation, flatus PR, belching	r = 0.43 - 0.60
Qu. 24,28,32	Abdominal pain, pain coinciding with bowel change, abdominal distension	r = 0.26 - 0.29
Qu. 20,22,23,34	Pellety stools, straining at stool, incomplete evacuation, laxative use	r = 0.26 - 0.51

GENERAL PRACTICE POPULATION

TABLE 33

MIDDLESEX HOSPITAL QUESTIONNAIRE (Crown-Crisp Experiential Index - CCEI)

G.P. Group (Means + SEM)

Subscales	Males (42)	p. value	Females (100)
Free-floating anxiety	4.58 ± 0.58	p < 0.001	7.98 ± 0.42
Phobic anxiety	3.33 ± 0.42	p < 0.001	5.23 ± 0.32
Obsessionality	6.28 ± 0.51	N.S.	6.43 ± 0.34
Somatic anxiety	5.18 ± 0.46	p = 0.04	6.75 ± 0.35
Depression	4.05 ± 0.49	N.S.	5.02 ± 0.30
Hysteria	3.75 ± 0.47	N.S.	3.52 ± 0.27
Total CCEI	27.15 ± 2.02	p < 0.001	34.92 ± 1.42

Statistics: Analysis of variance (F value)

TABLE 34

Correlation of CCEI scores and MAST Alcoholism Scores in the GP Group

CCI Subscale	Mast Score 0 (88)	Mast Score 1-4 (36)	Mast Score 5+ (18)
Free-floating anxiety	6.96 ± 0.47	7.33 ± 0.76	6.72 ± 0.80
Phobic anxiety	4.99 ± 0.33	3.39 ± 0.59	3.83 ± 0.56
Somatic anxiety	5.85 ± 0.36	7.50 ± 0.59	6.11 ± 0.65
Depression	4.36 ± 0.31	5.17 ± 0.59	5.78 ± 0.61
Total CCEI	31.93 ± 1.54	34.72 ± 2.65	32.67 ± 2.41

No significant differences were observed on an analysis of variance. However the female preponderance in the Mast = 0 group and male preponderance in the Mast = 5+ tend to weigh against the value of the analysis.

GENERAL PRACTICE POPULATION
TABLE 35

MIDDLESEX HOSPITAL QUESTIONNAIRE : COMPARISON OF THE GROUPS (MEAN + SEM)

Subscales	Alimentary Group (14)	Psychiatric Group (19)	All others (109)
* Free-floating anxiety (FFA)	7.07 ± 1.24	10.58 ± 0.69	6.39 ± 0.40
Phobic anxiety (PHO)	3.79 ± 0.88	5.11 ± 0.75	4.73 ± 0.30
Obsessionality (OBS)	6.57 ± 0.97	8.00 ± 0.78	6.08 ± 0.32
* Somatic anxiety (SOM)	7.93 ± 1.05	7.63 ± 0.53	5.86 ± 0.33
* Depression (DEP)	5.29 ± 0.87	6.84 ± 0.69	4.31 ± 0.28
Hysteria (HYS)	3.50 ± 0.65	4.79 ± 0.65	3.39 ± 0.27
* CCEI total	34.34 ± 4.02	42.95 ± 2.77	30.77 ± 1.33
Males:Females	4:10	1:18	37:72

* Analysis of variance

FFA	F = 8.35	P = 0.000
SOM	F = 4.12	P = 0.018
DEP	F = 6.10	P = 0.003
CCEI	F = 6.39	P = 0.002

PHO/OBS/HYS - No significant differences were found between the subgroups. No significant associations were found between the CCEI subscales and any of the alimentary symptoms detailed in the questionnaire.

THE HOSPITAL CLINIC POPULATION

THE CLINICAL DIAGNOSES

After a period of 12 weeks following admission into the study, each of the 134 clinical case notes was carefully examined in order to record the final diagnosis and tabulate the major clinical investigations undertaken to reach the diagnosis. When more than one diagnosis was found, only the principal diagnosis considered to account for the patient's presentation and symptomatic state was noted.

TABLE 36 : Diagnostic category and Principal diagnosis

Upper GI	Functional	(22)	Functional dyspepsia	(22)
	Organic	(26)	Alcoholic liver disease	(1)
			Aphthous mouth ulcers	(1)
			Gastric ulcer	(1)
			Cholelithiasis	(3)
			Oesophagitis	(6)
			Duodenal ulcer	(14)
Lower GI	Functional	(75)	Irritable bowel	(73)
			Pruritus ani	(1)
			Proctalgia fugax	(1)
	Organic	(11)	Coeliac disease	(1)
			Renal calculi	(2)
			Crohn's enteritis	(2)
			Colonic carcinoma	(2)
			Proctocolitis	(4)

TABLE 37
Diagnosis and the Clinical Investigations (Nos.)

			ENDOS	BaM	BaE	OCG	IVU	JX	
Upper GI	Functional	(22)	16	9	1	1	0	2	29
	Organic	(26)	18	8	0	2	1	0	29
Lower GI	Functional	(75)	16	19	48	5	1	11	100
	Organic	(11)	7	5	8	0	2	2	24

KEY
ENDOS: includes gastroscopy, colonoscopy, laparoscopy, ERCP
BaM: includes barium meal, barium follow through
BaE: barium enema
OCG: oral cholecystography ± ultrasound scan
IVU: intravenous urography
JX: jejunal biopsy

TOTAL NOS. OF INVESTIGATIONS

Functional group (97) = 127
Organic group (37) = 53

WRS + Chi square - N.S.

THE HOSPITAL CLINIC POPULATION

Table 38

Diagnostic Coding	Nos.	Sex (M/F)	Age (Mean ± SEM)
Functional - Upper GI Code (01)	22	11/11	37.6 ± 2.6
Organic upper GI Code (11)	26	13/13	38.7 ± 2.1
Functional lower GI Code (02)	75	24/51	36.8 ± 1.3
Organic lower GI Code (12)	11	6/5	38.6 ± 4.9
Total Nos. 134 (Functional	72%)	35/62	37.0 ± 1.4
(Organic	28%)	19/18	38.7 ± 2.7
(Upper	36%)	24/24	
(Lower	64%)	30/56	37.4 ± 1.0

No significant differences between the four diagnostic groups with respect to age were found by an analysis of variance, Wilcoxon and Chi square tests.

Table 39:

Diagnosis	V.		Marital Status: Single	Married	Div/Sep/Wid.	Signif.
Upper GI (48)	Functional	(22)	5	14	3	N.S.
	Organic	(26)	3	18	5	
Lower GI (86)	Functional	(75)	18	50	7	N.S.
	Organic	(11)	3	8	0	

Table 40:

Diagnosis	v.		Occupational Status: I	II	III	IV	V	Signif.
Upper GI (48)	Functional	(22)	2	3	7	9	1	N.S.
	Organic	(26)	4	4	8	6	4	
Lower GI (86)	Functional	(75)	4	20	33	13	5	N.S.
	Organic	(11)	2	3	2	4	0	

No significant differences in marital or occupational status were found on Chi square and Wilcoxon analysis between the four groups.

TABLE 41
Diagnosis and the Duration of Symptoms (months)

			Mean + SEM	0-6	7-12	13-24	24+
Upper GI	Functional	(22)	31.1 ± 7.0	7	3	3	9
	Organic	(26)	65.3 ± 11.7	4	2	7	13
Lower GI	Functional	(75)	45.0 ± 6.5	17	13	16	29
	Organic	(11)	25.3 ± 9.9	7	0	0	4

* Using chi square analysis, no significant difference between the four groups was observed. Since the data on the duration of symptoms cannot be assumed to be normally distributed, a Student t test cannot be applied, and a Wilcoxon Rank Sum test was undertaken. By this method, a statistically significant difference was found only in the upper GI group ($p < 0.02$).

GI Symptomatology

Symptoms were analysed with respect to the frequency of occurrence during the previous six months and considered of significance if experienced at least monthly.

UPPER ALIMENTARY SYMPTOMS

Table 42: Diagnosis (Question No. 10) V. NAUSEA

		Nil/Occas.	Monthly	Weekly	Daily
Upper GI	Functional	12	0	5	5
	Organic	15	2	5	4
Lower GI	Functional	45	11	5	14
	Organic	7	0	2	2

WRS + Chi squares - N.S.

Table 43: Diagnosis (Question No. 11) V. ANOREXIA

		Nil/Occas.	Monthly	Weekly	Daily
Upper GI	Functional	18	0	1	3
	Organic	23	0	1	2
Lower GI	Functional	54	6	8	7
	Organic	9	0	0	2

WRS + Chi squares - N.S.

Table 44: Diagnosis (Question No. 13) V. VOMITING

		Nil/Occas.	Monthly	Weekly	Daily
Upper GI	Functional	18	0	2	2
	Organic	24	0	0	2
Lower GI	Functional	68	1	2	4
	Organic	10	0	1	0

WRS + Chi squares - N.S.

Table 45: Diagnosis (Question No. 12) v. WEIGHT LOSS (6/12)

		Nil	1-6 lb	7-14 lb	15 lb+
Upper GI	Functional	9	9	2	2
	Organic	15	9	1	1
Lower GI	Functional	34	29	9	3
	Organic	6	3	1	1

WRS + Chi squares - N.S.

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TABLE 46 : Diagnosis (Question No. 14) V. ACID REFLUX

		Nil/Occas.	Monthly	Weekly	Daily
Upper GI	Functional	15	0	3	4
	Organic	17	0	3	5
Lower GI	Functional	50	7	10	8
	Organic	9	2	0	0

WRS + Chi squares - N.S.

TABLE 47 : Diagnosis (Question No. 15) V. GLOBUS

		Nil/Occas.	Monthly	Weekly	Daily
Upper GI	Functional	17	0	2	3
	Organic	24	0	2	0
Lower GI	Functional	68	3	4	0
	Organic	10	0	1	0

WRS + Chi squares - N.S.

TABLE 48 : Diagnosis (Question No. 16) V. HEARTBURN

		Nil/Occas.	Monthly	Weekly	Daily
Upper GI	Functional	16	2	1	3
	Organic	13	2	4	7
Lower GI	Functional	57	4	10	4
	Organic	9	0	1	1

WRS + Chi squares - N.S.

TABLE 49 : Diagnosis (Question No. 29) V. BELCHING

		Nil/Occas.	Monthly	Weekly	Daily
Upper GI	Functional	16	2	2	2
	Organic	18	0	5	3
Lower GI	Functional	58	4	7	6
	Organic	7	1	2	1

WRS + Chi squares - N.S.

THE HOSPITAL CLINIC POPULATION
LOWER ALIMENTARY SYMPTOMS

TABLE 50
Diagnosis (Question No. 17) V. BOWEL FREQUENCY/WEEK (Mean ± SEM)

* Upper GI	Functional	(22)	7.5 ± 0.7
	Organic	(26)	8.4 ± 0.8
* Lower GI	Functional	(75)	12.3 ± 1.0
	Organic	(11)	18.0 ± 3.6
	TOTAL	(134)	11.2 ± 0.7

Analysis of variance showed a significant difference betwen the groups Upper GI v Lower GI, $F = 17.7$, $P = 0.00$ but not Functional v Organic, $F = 3.8$, $P = 0.06$.

TABLE 51 : Diagnosis and the bowel frequency

		0-2/week	3-6/week	1-2/day	3+/day
Upper GI	Functional	2	15	5	0
	Organic	2	17	6	1
Lower GI	Functional	5	33	20	17
	Organic	1	1	5	4

Chi squares: Upper GI v Lower GI = 14.46, $P < 0.005$
Functional v Organic = 0.30. N.S.

TABLE 52 : Diagnosis (Question No. 18) V. MUCUS PR

		Nil/Occas.	Monthly	Weekly	Daily
Upper GI	Functional	21	0	1	0
	Organic	24	0	0	2
Lower GI	Functional	55	4	5	11
	Organic	8	1	0	2

WRS + Chi squares - N.S.

TABLE 53 : Diagnosis (Question No. 19) V. URGENCY OF DEFAECATION

		Nil/Occas.	Monthly	Weekly	Daily
Upper GI	Functional	21	0	1	0
	Organic	25	0	0	1
Lower GI	Functional	49	3	10	13
	Organic	4	1	3	3

WRS + Chi squares - N.S.

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TABLE 54 : Diagnosis (Question No. 20) V. PELLET/RIBBON STOOLS

		Nil/Occas.	Monthly	Weekly	Daily
Upper GI	Functional	21	0	1	0
	Organic	25	0	0	1
Lower GI	Functional	54	2	8	11
	Organic	5	0	4	2

WRS + Chi squares - N.S.

TABLE 55 : Diagnosis (Question No. 21) V. DIARRHOEA

		Nil/Occas.	Monthly	Weekly	Daily
Upper GI	Functional	18	3	1	0
	Organic	25	0	0	1
Lower GI	Functional	47	4	13	11
	Organic	4	0	3	4

WRS + Chi squares - N.S.

TABLE 56 : Diagnosis (Question No. 22) V. CONSTIPATION

		Nil/Occas.	Monthly	Weekly	Daily
Upper GI	Functional	19	2	1	0
	Organic	20	0	3	3
Lower GI	Functional	51	6	8	10
	Organic	7	0	1	3

WRS + Chi squares - N.S.

TABLE 57 : Diagnosis (Question No. 23) V. TENESMUS

		Nil/Occas.	Monthly	Weekly	Daily
Upper GI	Functional	19	3	0	0
	Organic	22	1	0	3
Lower GI	Functional	45	10	5	15
	Organic	5	0	1	5

WRS + Chi squares - N.S.

TABLE 58 : Diagnosis (Question No. 31) V. FLATULENCE PR

		Nil/Occas.	Monthly	Weekly	Daily
Upper GI	Functional	21	1	0	0
	Organic	23	1	1	1
Lower GI	Functional	56	3	12	4
	Organic	8	1	2	0

WRS + Chi squares - N.S.

TABLE 59 : Diagnosis (Question No. 32) V. ABDOMINAL DISTENSION

		Nil/Occas.	Monthly	Weekly	Daily
Upper GI	Functional	17	0	1	4
	Organic	20	2	2	2
Lower GI	Functional	35	4	10	26
	Organic	9	1	1	0

Total Functional > Monthly (45)
Chi square (Yates) = 5.9, $p < 0.02$
Total organic > Monthly (8)

TABLE 60 : Diagnosis (Question No. 34) V. LAXATIVE USE

		Nil/Occas.	Monthly	Weekly	Daily
Upper GI	Functional	21	1	0	0
	Organic	26	0	0	0
Lower GI	Functional	67	2	3	3
	Organic	9	2	0	0

WRS + Chi squares - N.S.

TABLE 61 : Diagnosis (Question No. 35) V. BREAKFAST ROUGHAGE INTAKE

		Nil/Occas.	Weekly	Daily
Upper GI	Functional	13	3	6
	Organic	15	3	8
Lower GI	Functional	34	12	29
	Organic	6	1	4

WRS + Chi squares - N.S.

TABLE 62 : Diagnosis (Questions 36, 37, 38) V. URINARY SYMPTOMS

		Nil/Occas.	Monthly	Weekly	Daily
UPPER GI					
Functional	Urgency	20	0	0	2
	Frequency	20	0	0	2
	Nocturia	19	0	0	3
Organic	Urgency	22	0	0	4
	Frequency	21	0	1	4
	Nocturia	17	0	2	7
LOWER GI					
Functional	Urgency	56	6	3	10
	Frequency	57	4	5	9
	Nocturia	54	2	3	16
Organic	Urgency	9	1	0	1
	Frequency	9	0	2	0
	Nocturia	9	0	2	0

WRS + Chi squares - N.S.

TABLE 63 : Diagnosis (Question No. 24) V. ABDOMINAL PAIN

		Nil/Occas.	Monthly	Weekly	Daily
Upper GI	Functional	9	2	5	6
	Organic	12	4	6	4
Lower GI	Functional	23	12	16	24
	Organic	6	1	2	2
	TOTAL (134)	50 (37%)	19 (14%)	29 (22%)	36 (27%)

WRS + Chi squares - N.S.

TABLE 64 : Diagnosis (Question No. 25) V. SITE OF ABDOMINAL PAIN

			Upper	Lower	Right	Left
* Upper GI	Functional	(18)	13	3	1	1
	Organic	(24)	14	5	3	2
* Lower GI	Functional	(69)	7	40	10	12
	Organic	(8)	3	4	0	1
	TOTAL	(119)	37 (31%)	52 (44%)	14 (12%)	16 (13%)
£ Both Function groups		(87)	20	43	11	13
Both Organic groups		(32)	17	9	3	3
ø Both Upper GI groups		(42)	27	8	4	3
Both Lower GI groups		(77)	10	44	10	13

N.B. 15 patients never experienced abdominal pain

* Chi squares + WRS - N.S.
£ Chi square = 10.0, $P < 0.02$
ø Chi square = 34.2, $P < 0.0001$

As anticipated, upper abdominal pain occurred significantly more frequently in the upper GI group and vice versa; lower abdominal pain occurred significantly more often in the functional group.

THE HOSPITAL CLINIC POPULATION
RELATIONSHIP BETWEEN ABDOMINAL PAIN AND BOWEL HABIT IN 119 PATIENTS

TABLE 65 : Change by defaecation (Question No. 26)

Diagnosis		Nil	Occas.	Usually
Upper GI	Functional (18)	10	6	2
	Organic (24)	13	8	3
Lower GI	Functional (69)	9	27	33
	Organic (8)	1	2	5

* N.S.

TABLE 66 : Change by flatus PR (Question No. 27)

Upper GI	Functional	8	9	1
	Organic	11	6	7
Lower GI	Functional	18	28	23
	Organic	2	2	4

* N.S.

TABLE 67 : Pain coinciding with bowel change (Question No. 28)

Upper GI	Functional	13	4	1
	Organic	17	4	3
Lower GI	Functional	20	22	27
	Organic	4	2	2

* N.S.

TABLE 68 : Change by belching (Question No. 30)

Upper GI	Functional	10	7	1
	Organic	7	10	7
Lower GI	Functional	45	13	11
	Organic	5	2	1

* N.S.

No significant differences were found by Wilcoxon Ranking or chi-square analysis between the functional and organic groups with respect to the change in abdominal pain following defaecation, flatus PR, belching or coincidence of a change in bowel habit with abdominal pain.

When patients who had never experienced a change in bowel habit at time of abdominal pain were compared with patients who had experienced this more than once during the previous six months, there was a significant association with the functional groups.

TABLE 69 : COMPARISON OF SYMPTOM PROFILE

SYMPTOM	FUNCTIONAL GROUP (n = 97)	Significance(1)	ORGANIC GROUP (n = 37)
ABDOMINAL PAIN * (MONTHLY)	65	N.S.	19
(WEEKLY)	51	N.S.	14
ABDOMINAL DISTENSION (MONTHLY)	45	$X^2 = 5.9, P<0.02$	8
(WEEKLY)	41	$X^2 = 8.6, P<0.01$	5
CHANGE IN ABDOMINAL PAIN AFTER DEFAECATION (2)*	68	$X^2 = 4.5$ $P<0.05$	18
CHANGE IN STOOL FREQUENCY OR CONSISTENCY AT TIMES OF ABDOMINAL PAIN (2)*	54	$X^2 = 6.2$ $P<0.02$	11

FOOTNOTE: (1) Significance = Chi square analysis with Yates' correction.

(2) Experienced more than once during the previous six months.

* Only 119 patients (89%) had experienced abdominal pain of whom 87 were in the functional group and 32, the organic group.

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TABLE 70 : Diagnosis (Question No. 39) + ALLERGIC DISORDERS

		Nil	Eczema	Rhinitis	Asthma
Upper GI	Functional	18	1	2	1
	Organic	19	3	2	2
Lower GI	Functional	60	3	9	3
	Organic	7	1	2	1
	TOTAL (134)	104 (78%)	8 (6%)	15 (11%)	7 (5%)

WRS + Chi squares - N.S.

TABLE 71 : Diagnosis (Question No. 44) + REGULAR CIGARETTE SMOKING

Upper GI	Functional	(22)	9
	Organic	(26)	15
Lower GI	Functional	(75)	27
	Organic	(11)	5
	TOTAL	(134)	56 (42%)

WRS + Chi squares - N.S.

TABLE 72 : Diagnosis (Question No. 43) + CANCERPHOBIA

		Never	Occas.	Often
Upper GI	Functional	14	5	3
	Organic	15	6	5
Lower GI	Functional	35	26	14
	Organic	7	4	0
	TOTAL (134)	71 (53%)	41 (31%)	22 (16%)

WRS + Chi squares - N.S.

TABLE 73 : Diagnosis (Question No. 40)
INFLUENCE OF 'NERVOUSNESS' ON ALIMENTARY SYMPTOMS

		No effect	Occas. affects	Usually affects
Upper GI	Functional	4	11	7
	Organic	5	12	9
Lower GI	Functional	21	31	23
	Organic	4	4	3
	TOTAL	34 (25%)	58 (43%)	42 (32%)

WRS + Chi squares - N.S.

TABLE 74 : Diagnosis (Question No. 41) PREVIOUS GP CONSULTATIONS WITH 'NERVES'

		Nil	Occas.	Often
Upper GI	Functional	13	9	0
	Organic	19	5	2
Lower GI	Functional	51	20	4
	Organic	9	2	0
	TOTAL (134)	92 (69%)	36 (27%)	6 (4%)

WRS + Chi squares - N.S.

TABLE 75 : Diagnosis (Question No. 42)
WORKING DAYS LOST DUE TO ALIMENTARY SYMPTOMS

		Nil/Occas.	5-10 days	10-28 days	28+ days/year
Upper GI	Functional	18	3	0	1
	Organic	22	0	3	1
Lower GI	Functional	54	4	7	10
	Organic	9	1	0	1
	TOTAL (134)	103 (77%)	8 (6%)	10 (7%)	13 (10%)

WRS + Chi squares - N.S.

TABLE 76 : Diagnosis V. CURRENT MENTAL STATE (Linear Analogue ratings 0-5)

		Anxiety scale					Depression scale				
		1	2	3	4	5	1	2	3	4	5
Upper GI	Functional	1	8	8	4	1	1	14	5	1	1
	Organic	1	14	6	5	0	1	21	2	1	1
Lower GI	Functional	2	34	20	17	2	6	47	16	5	1
	Organic	1	6	3	1	0	2	7	2	0	0
	TOTAL (134)	5	62	37	27	3	10	89	25	7	3

WRS + Chi squares - N.S.

	Mean ± SEM	Mean ± SEM
Functional (97)	2.78 ± 0.29	2.33 ± 0.08
Organic (37)	2.51 ± 0.14	2.16 ± 0.12
Significance	t = 1.6, N.S.	t = 1.2, N.S.

TABLE 77: Diagnosis V. COMMENTS IN THE GP REFERRAL LETTER

			Psychiatric factor	Social factor
* Upper GI	Functional	(22)	10	3
	Organic	(26)	2	1
Lower GI	Functional	(75)	29	6
	Organic	(11)	2	2
	TOTAL	(134)	43 (31%)	12 (9%)

* F v O Chi square (Yates) = 7.2, $p < 0.01$ (Upper GI group only)

TABLE 78 : Diagnosis V. MAST ALCOHOLISM SCORE

			Score 0	Score 0-4	Score 5+
Upper GI	Functional	(22)	11	17	5
	Organic	(26)	14	21	5
Lower GI	Functional	(72)	52	65	10
	Organic	(11)	9	11	0
	TOTAL	(134)	86	114	20 (15%)

WRS + Chi squares - N.S.

Males (54)	20	38	16
Females (80)	66	76	4

Chi square (Yates) = 13.5, $p < 0.01$

Cigarette smokers	43	13
Non-smokers	71	7

Chi square (Yates) = 4.1, $p < 0.05$

Single	20	9
Married	80	10
Div/Sep/Widowed	14	1

Chi square = 7.8, p 0.025

Alcoholism as defined by a MAST score of five or greater occurred significantly more often among males, smokers and the unmarried. No significant association was found between MAST scores of 5 or more and social class or any of the alimentary symptoms included in the questionnaire with TWO exceptions.

TABLE 79 : MAST SCORE V. VOMITING (Question No. 13)

	Nil/Occas.	Monthly	Weekly	Daily
0 - 4	104	1	5	4
5+	16	0	0	4

Chi square = 9.0, $p < 0.025$

TABLE 80 : MAST SCORE V. CONSTIPATION (Question No. 22)

	Nil/Occas.	Monthly	Weekly	Daily
0 - 4	80	5	13	16
5+	17	3	0	0

Chi square = 8.8, $p < 0.05$

Straining at stool (constipation) occurred significantly less often and regular vomiting occurred significantly more often in the alcoholism group compared to the low scorers on the MAST index.

TABLE 81 : CLUSTER ANALYSIS AND DISCRIMINANT FUNCTION OF GI SYMPTOMS

Using the cluster analysis program, BMDP, on the ICL 2988 mainframe computer, a clustering of alimentary symptoms was obtained by the minimum distance method within a correlation matrix.

The standard error of the correlation coefficient 'r' = 0.087; a significance of $p < 0.01$ and $p < 0.001$ can be inferred given 'r' values greater than 0.23 and 0.29 respectively.

Symptom clusters (Question Nos.)		Correlation coefficient
Qu. 11,12	Anorexia and weight loss	r = 0.43
Qu. 10,13,14	Nausea, vomiting and acid reflux	r = 0.35 - 0.44
Qu. 14,16,29	Acid reflux, heartburn and belching	r = 0.27 - 0.51
Qu. 29,30	Belching and relief with belching	r = 0.45
Qu. 17,19,21	Stool frequency, urgency and diarrhoea	r = 0.54 - 0.56
Qu. 18,20,22,23	Mucus PR, constipation, pellety stools and tenesmus	r = 0.36 - 0.54
Qu. 22,23,24	Constipation, tenesmus and abdominal pain	r = 0.26 - 0.36
Qu. 24,33	Abdominal pain and sleep disturbance	r = 0.42
Qu. 26,27,28,32	Abdominal pain changed by defaecation, flatus PR and coincides with bowel change plus abdo. distension	r = 0.33 - 0.51
Qu. 36,37,38	Urinary urgency, frequency and nocturia	r = 0.49 - 0.64

Significant associations between breakfast roughage intake and laxative use (r = 0.31) and the presence of comments in the GP referral letters of a psychiatric nature and of a social nature (r = 0.45) were also found.

Similar symptom clusters were identified when the functional group was examined separately. The relative contribution of each question in the clusters was assessed by principal components analysis and differential weighting was undertaken to produce a total score for each of the five clusters of symptoms which emerged as common to both the GP and hospital groups of patients.

Upper GI (A)	(Qu. 29,30)	Belching and relief of discomfort by belching
Upper GI (B)	(Qu. 10,13,14,16,29)	Nausea, vomiting, acid reflux, heartburn and belching
Lower GI (C)	(Qu. 18,20,22,23)	Mucus PR, constipation, pellety stools and tenesmus
Lower GI (D)	(Qu. 26,27,28)	Abdominal pain - changed with defaecation - changed with flatus PR - coincides with bowel change
Urinary tract (E)	(Qu. 36,37,38)	Urinary urgency, frequency and nocturia

Derived symptom scores were achieved by principal components analysis and were as follows:

Upper GI (A) = (0.6 x Qu.29) + (0.9 x Qu.30) - (0.9 if Qu.30 = 0)

Lower GI (B) = (0.4 x Qu.10) + (0.5 x Qu.13) + (0.8 x Qu.14) + (0.8 x Qu.16) + (0.5 x Qu.29)

Lower GI (C) = (0.6 x Qu.18) + (0.7 x Qu.20) + (0.8 x Qu.22) + (0.8 x Qu.23)

Lower GI (D) = (0.9 x Qu.26) + (0.8 x Qu.27) + (0.8 x Qu.28)

Urinary tract (E) = (0.8 x Qu.36) + (0.9 x Qu.37) + (0.8 x Qu.38)

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TABLE 82 : DIAGNOSIS V. UPPER GI (A) SYMPTOM CLUSTER

		Mean Scores + SEM	Significance (F tests)
Upper GI	Functional	0.52 ± 0.29	
	Organic	1.15 ± 0.28	N.S.
Lower GI	Functional	0.35 ± 0.16	
	Organic	0.70 ± 0.41	

TABLE 83 : DIAGNOSIS V. UPPER GI (B) SYMPTOM CLUSTER

Upper GI	Functional	4.08 ± 0.65	
	Organic	4.86 ± 0.56	N.S.
Lower GI	Functional	3.61 ± 0.30	
	Organic	3.06 ± 0.61	

TABLE 84 : DIAGNOSIS V. LOWER GI (C) SYMPTOM CLUSTER

Upper GI	Functional	1.75 ± 0.36	
	Organic	2.85 ± 0.43	*
Lower GI	Functional	4.30 ± 0.34	
	Organic	4.97 ± 1.23	

* Upper v lower F = 15.3, p = 0.0002

Functional v organic N.S.

TABLE 85 : DIAGNOSIS V. LOWER GI (D) SYMPTOM CLUSTER

Upper GI	Functional	1.03 ± 0.24	
	Organic	1.41 ± 0.31	*
Lower GI	Functional	2.72 ± 0.19	
	Organic	2.15 ± 0.64	

* Upper v lower, F = 12.0, p = 0.0007

Functional v organic N.S.

TABLE 86 : DIAGNOSIS		V.	URINARY TRACT (E) SYMPTOM CLUSTER
Upper GI	Functional	2.24 ± 0.60	
	Organic	3.49 ± 0.59	N.S.
Lower GI	Functional	3.26 ± 0.32	
	Organic	2.20 ± 0.73	

* As anticipated, lower GI symptom clusters occurred at significantly higher scores in the lower GI group but similar findings were not observed with upper GI symptom clusters in the upper GI group.

TABLE 87

MIDDLESEX HOSPITAL QUESTIONNAIRE : COMPARISON OF THE GP AND HOSPITAL GROUPS

(Crown-Crisp Experiential Index - CCEI)

Subscales	(Means + SEM) GP Group (142)	Hospital Group (134)
Free-floating anxiety (FFA)	7.02 ± 0.36	6.78 ± 0.33
Phobic anxiety (PHO)	4.69 ± 0.26	4.44 ± 0.27
Obsessionality (OBS) *	6.39 ± 0.28	7.22 ± 0.30
Somatic anxiety (SOM) **	6.30 ± 0.29	7.24 ± 0.29
Depression (DEP)	4.75 ± 0.26	4.73 ± 0.25
Hysteria (HYS)	3.58 ± 0.23	4.07 ± 0.26
TOTAL CCEI	32.73 ± 1.20	34.49 ± 1.13
Males	42	54
Females	100	80
Age	34.8 ± 0.96	37.4 ± 1.02

* $t = 2.03$, $p < 0.05$
** $t = 2.29$, $p < 0.05$

No other significant differences using Student t tests were found.

TABLE 88
Correlation of CCEI scores and MAST Alcoholism Scores in the Hospital Group

CCI Subscale	Mast Score 0 (86)	Mast Score 1-4 (28)	Mast Score 5+ (20)
FFA	6.74 ± 0.42	6.75 ± 0.65	7.00 ± 1.03
PHO	4.41 ± 0.34	4.39 ± 0.62	4.65 ± 0.72
SOM	7.13 ± 0.40	7.18 ± 0.57	7.80 ± 0.53
DEP	4.56 ± 0.31	4.68 ± 0.55	5.55 ± 0.68
TOTAL CCEI	33.86 ± 1.50	35.04 ± 2.30	36.45 ± 2.92

Analysis of variance N.S.

TABLE 89

COMPARISON OF THE CCEI PROFILES IN THE HOSPITAL GROUPS FUNCTIONAL V. ORGANIC (Means ± SEM)

Subscales	Functional (97)	p. value	Organic (37)
* FFA	7.28 ± 0.40	p < 0.02	5.49 ± 0.54
PHO	4.57 ± 0.33	N.S.	4.11 ± 0.48
OBS	7.23 ± 0.36	N.S.	7.22 ± 0.54
SOM	7.58 ± 0.35	N.S.	6.35 ± 0.53
* DEP	5.08 ± 0.29	p < 0.025	3.81 ± 0.47
HYS	4.22 ± 0.30	N.S.	3.70 ± 0.50
TOTAL CCEI	35.95 ± 1.32	p < 0.04	30.68 ± 2.09

* Using Bonferroni test (to correct for sex) significant differences remain ($p < 0.05$).

Males	35 (36%)	19 (51%)
Females	62 (64%)	18 (49%)

TABLE 90

COMPARISON OF THE CCEI PROFILES IN MALES AND FEMALES WITHIN THE HOSPITAL GROUP

Subscales	Males (54)	p. value	Females (80)
FFA	5.80 ± 0.52	p < 0.001	7.45 ± 0.42
PHO	3.78 ± 0.43	p < 0.001	4.89 ± 0.35
OBS	6.82 ± 0.47	N.S.	7.50 ± 0.38
SOM	7.11 ± 0.35	N.S.	7.33 ± 0.43
DEP	4.48 ± 0.40	N.S.	4.90 ± 0.33
HYS	4.24 ± 0.43	N.S.	3.96 ± 0.33
TOTAL CCEI	32.33 ± 1.70	p < 0.001	36.03 ± 1.50

Functional Group	35	62
Organic Group	19	18

TABLE 91

A comparison of the Psychoneurotic Profile (CCEI) and MAST Alcoholism Score

PSYCHONEUROTIC PROFILE	Functional (n = 97)	Organic (n = 37)	Significance t test	After correctio for age + sex correction
Free-floating ANXIETY	7.28 ± 0.40	5.49 ± 0.54	$p < 0.02$	$p < 0.05$
DEPRESSION	5.08 ± 0.29	3.81 ± 0.47	$p < 0.025$	$p < 0.05$
TOTAL CCEI	35.95 ± 1.32	30.68 ± 2.09	$p < 0.04$	$p = 0.06$
MAST (No. of patients)			Wilcoxon rank sum test	
Score = 0 (86)	63	23	N.S.	
Score = 1-4 (28)	19	9	N.S.	
Score = 5+ (20)	15	5	N.S.	

PSYCHONEUROTIC PROFILE (CCEI) IN THE HOSPITAL GROUP

TABLE 92

DIAGNOSIS		v. CCEI Subscales (Mean + SEM)			F value
FFA					
Upper GI	Functional	7.68 ± 0.80	N.S.	U v L	F = 4.77 P = 0.03
	Organic	6.39 ± 0.59			
Lower GI	Functional	7.16 ± 0.47		F v O	F = 9.86 P = 0.002
	Organic	3.36 ± 0.91			
PHO					
Upper GI	Functional	3.82 ± 0.73		U v L	N.S.
	Organic	4.50 ± 0.61			
Lower GI	Functional	4.79 ± 0.37		F v O	N.S.
	Organic	3.18 ± 0.64			
OBS					
Upper GI	Functional	6.46 ± 0.65		U v L	N.S.
	Organic	7.69 ± 0.57			
Lower GI	Functional	7.45 ± 0.42		F v O	N.S.
	Organic	6.09 ± 1.20			
SOM					
Upper GI	Functional	7.18 ± 0.62	N.S.	U v L	N.S.
	Organic	7.08 ± 0.61			
Lower GI	Functional	7.69 ± 0.41		F v O	F = 4.81 P = 0.03
	Organic	4.64 ± 0.90		Interaction	F = 4.2 P = 0.04

TABLE 92 : Contd

DIAGNOSIS v. CCEI Subscales (Mean + SEM)

DEP				F value
Upper GI	Functional	6.09 ± 0.48	U v L	F = 4.86 P = 0.03
	Organic	4.23 ± 0.60		
Lower GI	Functional	4.79 ± 0.35	F v O	F = 9.66 P = 0.002
	Organic	2.82 ± 0.66		
HYS				
Upper GI	Functional	5.00 ± 0.68	U v L	N.S.
	Organic	3.62 ± 0.59		
Lower GI	Functional	3.99 ± 0.34	F v O	N.S.
	Organic	3.91 ± 0.99		
TOTAL CCEI				
Upper GI	Functional	36.23 ± 2.09	U v L	N.S.
	Organic	33.50 ± 2.52		
Lower GI	Functional	35.87 ± 1.61	F v O	F = 6.86 P = 0.01
	Organic	24.00 ± 3.05		

The results given were assessed by an analysis of variance. However, since a normal distribution of CCEI scores cannot be assumed, the non-parametric Wilcoxon Rank Sum Test was also used to confirm these differences between the upper GI and lower GI groups and functional and organic groups.

Only in respect of somatic anxiety (SOM) did analysis of variance reveal a statistically significant interaction (P = 0.04) between the site (upper GI - lower GI), the nature of disorder (functional - organic) and the somatic anxiety score. This finding is of significance in that it reveals that the difference in this score between the functional and organic groups is not the same for the upper GI group compared with the lower GI group. Furthermore, the statistically significant difference in this score applies only to the lower GI group and not the upper GI group.

TABLE 93

REGRESSION ANALYSIS AND CCEI SUBSCALE SCORES IN THE HOSPITAL GROUP

By comparing the F-ratios from an analysis of variance, the significance of the differences between the two groups functional and organic can be assessed after age and sex have also been considered. The relationship between the CCEI scores and age, sex and diagnosis can be expressed by regression equations when sex is coded 0 (male), 1 (female) and the diagnosis coded 0 (functional) and 1 (organic). Age was not found to be significantly associated with either FFA or total CCEI scores, only with DEP scores.

FFA	Significance (F ratio)	
Regression on AGE	$F < 1$	N.S.
Regression on SEX after age	$F = 5.7$	$p < 0.05$
Regression on DIAGNOSIS after age and sex	$F = 4.6$	$p < 0.05$

FFA = 6.49 - 0.004. AGE + 1.43. SEX - 1.57. DIAGNOSIS

DEP		
Regression on AGE	$F = 9.4$	$p < 0.01$
Regression on SEX after age	$F = 2.7$	$p < 0.1$
Regression on DIAGNOSIS after age and sex	$F = 5.7$	$p < 0.05$

DEP = 1.97 + 0.07. AGE + 0.67. SEX - 1.29. DIAGNOSIS

TOTAL CCEI		
Regression on AGE	$F = 1.8$	N.S.
Regression on SEX after age	$F = 4.3$	$p < 0.05$
Regression on DIAGNOSIS after age and sex	$F = 3.9$	$p < 0.05$

TOTAL CCEI = 26.65 + 0.18. AGE + 4.20. SEX - 4.93. DIAGNOSIS

TABLE 94 LOGISTIC REGRESSION ANALYSIS OF THE PROBABILITY OF A FUNCTIONAL DISORDER USING AGE, SEX AND CCEI SCORES IN THE HOSPITAL GROUP

FUNCTIONAL UPPER GI DISORDER

$$(n = 48) \quad p = \frac{\exp.(0.46 - 0.19\ \text{sex} - 0.04\ \text{age} - 0.003\ \text{FFA} + 0.33\ \text{DEP}^*)}{1 + \exp.(0.46 - 0.19\ \text{sex} - 0.04\ \text{age} - 0.003\ \text{FFA} + 0.33\ \text{DEP}^*)}$$

FUNCTIONAL LOWER GI DISORDER

$$(n = 86) \quad p = \frac{\exp.(0.61 + 0.24\ \text{sex}^* - 0.01\ \text{age} + 0.24\ \text{FFA}^* + 0.15\ \text{DEP})}{1 + \exp.(0.61 + 0.24\ \text{sex}^* - 0.01\ \text{age} + 0.24\ \text{FFA}^* + 0.15\ \text{DEP})}$$

N.B. 1. Male = (-1), Female = (+1)

2. DEP = Depression subscale score on CCEI
   FFA = Free-floating Anxiety subscale score on CCEI

3. * Significant regression coefficients (r)

   Upper GI (DEP), $p < 0.05$

   Lower GI (FFA), $p < 0.05$

   (Sex), $p < 0.05$

TABLE 95 : Psychiatric factors significantly associated with functional bowel disorders in the hospital group

UPPER GI GROUP	LOWER GI GROUP
n = 22 (46%)	n = 75 (87%)
* DEPRESSION ($P < 0.05$)	* ANXIETY ($P < 0.01$)
PSYCHIATRIC COMMENT ($P < 0.01$) in GP referral letter (Table 77)	

* CCEI subscale scores FFA + DEP (Table 94).

Correlations within CCEI subscale scores

Using the Spearman method of ranking correlation coefficients on a BMDP program for the ICL 2988 computer, it was possible to cross-correlate the subscores of the CCEI to identify those subscales in closest agreement. Since the standard error of the correlation coefficient = 0.087, a significance of $P < 0.01$ and $P < 0.001$ can be inferred when the correlation coefficient exceeds 0.224 and 0.286 respectively.

TABLE 96

SPEARMAN RANK CORRELATION COEFFICIENTS OF THE CCEI SUBSCALES IN THE HOSPITAL GROUP

	FFA	PHO	OBS	SOM	DEP	HYS
FFA	1.00					
PHO	0.51	1.00				
OBS	0.40	0.41	1.00			
SOM	0.37	0.22	0.16	1.00		
DEP	0.49	0.37	0.35	0.44	1.00	
HYS	0.39	0.26	0.09	0.02	0.10	1.00
CCEI TOTAL	0.84	0.70	0.61	0.53	0.69	0.45

The closest correlation with the CCEI total is seen with FFA, DEP, SOM and PHO. Using THREE subscales, and the CCEI total scores, a rank correlation of alimentary symptoms with psychiatric symptoms was undertaken together with a correlation of clusters of alimentary symptoms and psychiatric symptoms. The SOM subscale was excluded since it included three questions of an alimentary nature.

TABLE 97

CORRELATION OF GI SYMPTOM CLUSTERS AND CCEI SUBSCALES IN THE HOSPITAL GROUP

GI Symptom Clusters (Derived)		Spearman Rank Correlation Coefficients			
		FFA	PHO	DEP	CCEI TOTAL
Upper GI	(A)	0.00	0.04	0.02	0.00
Upper GI	(B)	0.15	0.06	0.09	0.20
Lower GI	(C)	0.00	0.07	0.02	0.05
Lower GI	(D)	0.07	0.11	0.00	0.07
Urinary tract Symptoms	(E)	0.30	0.18	0.26	0.31

Urinary symptoms of urgency, frequency and nocturia are significantly associated with high anxiety, depression and total CCEI scores ($P < 0.001$).

TABLE 98 : CORRELATION OF CCEI SUBSCALE SCORES AND GI SYMPTOMS IN THE HOSPITAL GROUP

CCEI SUBSCALE	GI SYMPTOMS	Correlation Coefficient
Free-floating anxiety	Anorexia	0.24
	Weight loss	0.28
	Urinary urgency	0.32
Phobic anxiety	Abdominal distension	0.25
	Urinary urgency	0.28
Depression	Anorexia	0.25
	Weight loss	0.26
	Globus	0.24
	Abdominal pain	0.24
	Urinary urgency	0.26
TOTAL CCEI	Anorexia	0.29
	Acid reflux	0.29
	Urinary urgency	0.37
	Urinary frequency	0.29

Ranked correlations of the CCEI subscales with all GI symptoms did not reveal any further significant associations which were not readily explicable (somatic anxiety scores were excluded from analysis as they are based on GI symptoms). Finally, logistic analysis was applied to investigate possible associations between the diagnosis and the GI symptoms and psychiatric symptoms. A linear logistic regression model was used to relate a given function of the probability of a "FUNCTIONAL DIAGNOSIS" to a linear function of the clinical variables. The only variables to emerge as statistically significant are given below. Though ANXIETY and DEPRESSION assist the characterisation of lower GI and upper GI functional groups respectively, their predictive value in individual patients is limited.

TABLE 99:

LINEAR LOGISTIC REGRESSION ANALYSIS OF THE PROBABILITY OF A FUNCTIONAL DISORDER IN THE HOSPITAL GROUP

GROUP	VARIABLE	Regression Coefficient/ SE Ratio	p value
UPPER GI (n = 48)	Psychiatric comment in GP's letter	2.54	$p < 0.05$
	Infrequent straining at stool (< 1/month)	2.17	$p < 0.05$
	Depression (DEP)	2.72	$p < 0.05$
LOWER GI (n = 86)	Anxiety (FFA)	2.29	$p < 0.05$
	Abdominal pain and distension	2.56	$p < 0.05$
	Stool frequency (< 3/day)	2.10	$p < 0.05$

FOOTNOTE: * CCEI SUBSCALES FFA + DEP (TABLE 94)

DOMICILIARY INTERVIEW DATA FROM RANDOMLY SELECTED HOSPITAL GI REFERRALS

Total interviewed N = 64

Male - Female N = 25 - 39

Mean age ± SEM = 39.3 ± 1.46 years

TABLE 100: CLINICAL DIAGNOSES IN 64 HOSPITAL PATIENTS

Diagnostic Groups	Sex (Male + Female)
1. Upper GI (11) Functional - Dyspepsia	(6 + 5)
2. Upper GI (9) Organic disease Mouth ulcers (1) Oesophagitis (1) Duodenal ulcer (7)	(5 + 4)
3. Lower GI (37) Functional - Irritable bowel	(11 + 26)
4. Lower GI (7) Organic disease Coeliac disease (1) Crohn's enteritis (2) Colonic carcinoma (1) Proctocolitis (3)	(3 + 4)

FEMALE CONTROL GROUP

38 women were selected from a random sample of women previously identified from the electoral register and not seeking health care. This cohort of women had been the focus of extensive study. Subjects with overt gastrointestinal disease were excluded. No match could be found for a 29 year old widow in the study group. The control group was selected to closely match the remaining 38 women in the study group with respect to AGE, SOCIAL CLASS and MARITAL STATUS.

No data on CCEI subscale scores or MAST scores were available for the control group of females.

TABLE 101

Diagnosis V. MIDDLESEX HOSPITAL QUESTIONNAIRE CCEI SUBSCALES (Mean + SEM)

			FFA	PHO	DEP	CCEI TOTAL
Upper GI	Functional	(11)	6.64 ± 1.21	4.09 ± 1.25	6.09 ± 0.72	32.73 ± 3.47
	Organic	(9)	5.22 ± 0.55	4.22 ± 0.83	4.22 ± 0.83	31.89 ± 2.38
Lower GI	Functional	(37)	8.19 ± 0.69	5.49 ± 0.59	5.30 ± 0.54	38.84 ± 2.57
	Organic	(7)	3.71 ± 1.25	2.71 ± 0.81	2.71 ± 0.71	23.86 ± 3.53
TOTAL NO.		(64)	7.02 ± 0.51	4.75 ± 0.44	5.00 ± 0.38	35.17 ± 1.77

Significant differences were found only between the two lower GI groups using Student t tests ($P < 0.01$)
FFA - t = 3.14
PHO - t = 2.77
DEP - t = 2.90
CCEI - t = 3.43

TABLE 102

Diagnosis			V. PSYCHIATRIC ASSESSMENT SCORES (PAS) (Current symptoms) Mean + SEM
Upper GI	Functional	(11)	6.82 ± 1.76
	Organic	(9)	2.44 ± 1.12
Lower GI	Functional	(37)	7.38 ± 0.98
	Organic	(7)	4.00 ± 1.45
TOTAL NO.		(64)	6.22 ± 0.71
All functional		(48)	7.25 ± 0.85
All organic		(16)	3.13 ± 0.88

Significance

Upper GI, $t = 2.1$, N.S.
Lower GI, $t = 1.9$, N.S.
F v O $t = 6.2$, $P < 0.001$

The PAS scores were assessed as previously described in FIVE levels of 'caseness'

Level 1 - No psychiatric symptoms (Score = 0)

Level 2 - Non-specific symptoms Total score 1-4

Level 3 - Non-specific symptoms Total score 5-9

Level 4 - Specific symptoms scoring 10+ or a key affective symptom present (BORDERLINE caseness)

Level 5+ - Threshold psychiatric CASENESS Total score 11+ with two or more key affective symptoms present in at least moderate severity.

TABLE 103: INDEX OF DEFINITION PAS SCORING CATEGORIES

			ID LEVELS (1)	(2+3)	(4+)		CHI^2 Signif.
Upper GI	Functional	(11)	1	6	4		N.S.
	Organic	(9)	4	5	0		
Lower GI	Functional	(37)	4	17	16		N.S.
	Organic	(7)	2	4	1		
Total Functional		(48)	5	23	20	(42%)	$Chi^2 = 5.3$
Total Organic		(16)	6	9	1	(6%)	$p < 0.05$
TOTAL		(64)	11	32	21		

TABLE 104: V. 'INDEX OF DEFINITION' CASENESS

Diagnosis			Case (Level 5+)	Signif.	Non-Case
Upper GI	Functional	(11)	3	N.S.	8
	Organic	(9)	0		9
Lower GI	Functional	(37)	11	N.S.	26
	Organic	(7)	0		7
TOTAL NOS.		(64)	*14 (22%)		50
	Functional	(48)	**14 (29%)	P 0.05	34
	Organic	(16)	0		16

* Group comprised 3 males + 11 females

** Chi square (Yates correctn.) F v O = 4.4, P < 0.05

TABLE 105: RESEARCH DIAGNOSTIC CATEGORIES OF 'CASENESS'

RESEARCH DIAGNOSTIC CRITERIA		DIAGNOSIS Upper F	Upper O	Lower F	Lower O
Non-case Categ. 0	(46)	5	9	26	6
Major depression Categ. 1	(4)	1	0	3	0
Probable major depression Categ. 2	(4)	1	0	3	0
Minor depression Categ. 3	(3)	2	0	0	1
Probable minor depression Categ. 4	(0)	0	0	0	0
Panic disorder Categ. 5	(0)	0	0	0	0
Probable minor panic disorder Categ. 6	(2)	0	0	2	0
Generalised anxiety disorder Categ. 7	(5)	2	0	3	0

TOTAL NO. CASES = 18 (5 males and 13 females)

TABLE 106

Diagnosis			v. Case		RDC 'CASENESS' Signif.	Non-Case
Upper GI	Functional	(11)	6		N.S.	5
	Organic	(9)	0			9
Lower GI	Functional	(37)	11		N.S.	26
	Organic	(7)	1			6
TOTAL NOS.		(64)	18	(28%)		46
	Functional	(48)	17	(35%)	$Chi^2 = 5.0$ $P < 0.05$	31
	Organic	(16)	1	(6%)		15

TABLE 107

DIAGNOSIS V. CURRENT AND/OR PREVIOUS PSYCHIATRIC ILLNESS (RDC

			Present (+)ve		Absent (-)ve
Upper GI	Functional	(11)	6	N.S.	5
	Organic	(9)	1		8
Lower GI	Functional	(37)	20	N.S.	17
	Organic	(7)	1		6
TOTAL (64)	Functional	(48)	26 (54%)		22
	Organic	(16)	2 (12%)		14

Chi square = 6.9, $p < 0.01$

These data were derived from the tape-recorded PAS interviews and a clinical diagnosis was appended based on current psychiatric symptoms and past psychiatric episodes using the RDC criteria.

TABLE 108: CORRELATION OF CCEI SCORES AND 'INDEX OF DEFINITION' CASENESS

CCEI Subscales	ID CASENESS LEVELS (1)	(2)	(3)	(4)	(5)
(Mean ± SEM)	Nos. (11)	(18)	(14)	(7)	(14)
FFA	3.09 ± 0.63	6.83 ± 0.80	5.50 ± 0.92	10.14 ± 1.18	10.29 ± 0.94
		F = 10.1, p = 0.0000			
PHO	2.36 ± 0.68	3.50 ± 0.58	4.21 ± 0.75	6.57 ± 1.13	7.86 ± 1.06
		F = 7.3, p = 0.001			
DEP	2.27 ± 0.60	4.61 ± 0.59	4.57 ± 0.68	5.29 ± 0.61	7.93 ± 0.82
		F = 8.3, p = 0.0000			
CCEI TOTAL	21.64 ± 2.91	32.67 ± 2.56	31.36 ± 2.69	43.57 ± 4.37	48.64 ± 3.46
		F = 10.9, p = 0.0000			

There was no significant correlation between ID levels and the subscale scores for obsessionality and hysteria, using the same method of analysis of variance.

A comparison of the CCEI sub-scores of levels 4 and 5 revealed that only in the case of depression was there a significant difference betwen ID levels 4 and 5.

(DEP - $t = 2.58$, $p < 0.02$)

TABLE 109

INDEX OF DEFINITION "CASENESS" V. CCEI SUBSCALE SCORES

CCEI Subscales	'INDEX OF DEFINITION' CASE (14)	(Means ± SEM) (Significance (t test))	CASENESS NON-CASE (50)
FFA	10.29 ± 0.94	t = 3.8 p = 0.0004	6.10 ± 0.53
PHO	7.86 ± 1.06	t = 4.3 p = 0.0001	3.88 ± 0.40
DEP	7.93 ± 0.82	t = 4.8 p = 0.0000	4.18 ± 0.35
TOTAL CCEI	48.64 ± 3.46	t = 4.6 p = 0.0000	31.40 ± 1.71

No significant differences were found with the obsessionality and hysteria subscales. As expected the somatic anxiety subscales, also showed significant differences between case and non-case.

TABLE 110
RESEARCH DIAGNOSTIC "CASENESS" V. CCEI SUBSCALE SCORING

CCEI Subscales	RDC CASENESS CASE (18)	(Means ± SEM) (Significance (t test))	NON-CASE (46)
FFA	9.90 ± 0.77	t = 3.9 p = 0.0002	5.89 ± 0.56
PHO	6.78 ± 0.90	t = 3.1 p = 0.003	3.96 ± 0.45
DEP	6.94 ± 0.76	t = 3.5 p = 0.001	4.24 ± 0.38
TOTAL CCEI	41.72 ± 2.86	t = 3.7 p = 0.0005	31.44 ± 1.94

No significant differences were found with the obsessionality and hysteria subscales. The somatic anxiety scores differed significantly as expected. Since they are based on alimentary symptoms, they were excluded from further analysis.

TABLE 111: CORRELATION OF CCEI SCORES AND RDC CASENESS

CCEI SUBSCALE	RDC CATEGORIES (Mean ± SEM) 0	1	2	3	6	7
Nos.	(46)	(4)	(4)	(3)	(2)	(5)
FFA	5.89 ± 0.56	10.75 ± 2.29	10.00 ± 1.23	10.00 ± 1.53	13.50 ± 0.50	7.60 ± 1.25
			F = 3.9, p = 0.004			
PHO	3.96 ± 0.45	7.25 ± 1.65	10.50 ± 1.71	3.67 ± 0.33	11.00 ± 1.00	3.60 ± 0.60
			F = 6.5, p = 0.0001			
DEP	4.24 ± 0.38	6.50 ± 1.19	9.75 ± 0.75	5.33 ± 1.20	10.00 ± 0.00	4.80 ± 1.77
			F = 6.5, p = 0.0002			
TOTAL CCEI	31.44 ± 1.94	52.75 ± 4.75	49.75 ± 3.50	38.00 ± 1.53	59.50 ± 6.50	32.40 ± 3.91
			F = 5.3, p = 0.0004			

There was no significant correlation between the RDC categories and the subscale scores for obsessionality and hysteria, using the same method of analysis of variance.

TABLE 112: CORRELATIONS OF PSYCHIATRIC CASENESS WITH ANXIETY AND DEPRESSION RATINGS

	LINEAR ANALOGUE SCALES (0-5)					
	ANXIETY			DEPRESSION		
ID	1-2	3	4-5	1-2	3	4-5
CASE (14)	2	5	7	5	7	2
NON CASE (50)	25	17	8	38	7	5
Chi square (Yates)	= 8.7			9.3		
	p < 0.02			p < 0.01		

RDC	ANXIETY			DEPRESSION		
	1-2	3	4-5	1-2	3	4-5
CASE (18)	1	8	9	6	8	4
NON CASE (46)	26	14	6	37	6	3
Chi square	16.2			13.0		
	p < 0.001			p < 0.01		

Neither ID nor RDC caseness was significantly associated with the presence on the general practitioners' referral letters of psychiatric or social factors.

TABLE 113:DIAGNOSIS V. ANXIETY AND DEPRESSION RATINGS

Mean ± SEM (Linear Analogue Scales 0-20)

		ANXIETY	DEPRESSION
Upper GI	Functional (11)	5.09 ± 1.07	4.64 ± 0.88
	Organic (9)	4.89 ± 0.69	4.44 ± 1.23
Lower GI	Functional (37)	7.05 ± 0.57 *	5.14 ± 0.48
	Organic (7)	4.00 ± 0.53	4.29 ± 0.68
Total (64)	Functional (48)	6.66 ± 0.52 **	5.02 ± 0.42
	Organic (16)	4.50 ± 0.46	4.38 ± 0.74

* Significance (F v O) $t = 3.9$, $p < 0.001$
** Significance (F v O) $t = 3.1$, $p < 0.01$ N.S.

Significant differences were observed only for line-rated anxiety and only between the lower GI groups and the total functional versus organic groups using Student t tests.

TABLE 114: DIAGNOSIS V. MAST ALCOHOLISM SCORE

			Score 0	Score 1-4	Score 5+	(Sex)
Upper GI	Functional	(11)	4	4	3	(M)
	Organic	(9)	4	3	2	(M+F)
Lower GI	Functional	(37)	28	6	3	(M)
	Organic	(7)	6	1	0	
Total (64)	Functional	(48)	32	10	6	(M)
	Organic	(16)	10	4	2	(M+F)
	TOTAL (64)		42 (66%)	14	8 (12.5%)	

N.S.

No significant differences in MAST scores were observed between the functional and organic groups using chi square analysis. However, there was a significant difference between the upper and lower GI groups ($chi^2 = 8.8$, $p < 0.01$).

TABLE 115: CORRELATION OF PSYCHIATRIC CASENESS WITH MAST ALCOHOLISM SCORE

			MAST SCORE 0-4		MAST SCORE 5+
ID	Case	(14)	13	N.S.	1
	Non Case	(50)	43		7
RDC	Case	(18)	16	N.S.	2
	Non Case	(46)	40		6

No significant differences were found using chi square analysis between cases and non cases with respect to alcoholism index.

TABLE 116: DIAGNOSIS V. REGULAR CIGARETTE SMOKING

Upper GI	Functional	(11)	4	
	Organic	(9)	5	
Lower GI	Functional	(37)	13	
	Organic	(7)	3	
TOTAL	Functional	(48)	17	Chi square - N.S.
	Organic	(16)	8	

LIFE SITUATIONS INVENTORY IN 64 HOSPITAL PATIENTS

(A) QUANTITATIVE ASSESSMENT

TABLE 117: Nos. of patients NOT experiencing events and difficulties during the six months prior to interview

DIAGNOSIS		EVENTS = 0		DIFFICULTIES = 0	
Upper GI	Functional (11)	6	N.S.	1	N.S.
	Organic (9)	3		1	
Lower GI	Functional (37)	13	N.S.	4	N.S.
	Organic (7)	1		2	
TOTAL (64)					
	Functional (48)	19 (40%)	N.S.	5 (10%)	N.S.
	Organic (16)	4 (25%)		3 (19%)	

Nos. experiencing NEITHER an event NOR a difficulty of an unpleasant nature.

Functional (48)	5 (10%)	N.S.	
Organic (16)	2 (12%)		

No significant differences between the groups emerged on chi square analysis.

TABLE 118: Nos. of patients experiencing pleasant events and difficulties during the six months prior to interview

(Eoo/Doo = nos. of episodes)

DIAGNOSIS		EVENT (Eoo)		DIFFICULTY (Doo)	
Upper GI	Functional (11)	1 (2)	N.S.	0	N.S.
	Organic (9)	5 (7)		0	
Lower GI	Functional (37)	17 (28)	N.S.	1 (2)	N.S.
	Organic (7)	6 (20)		0	
TOTAL (64)					
	Functional (48)	18 (30)	$p < 0.02$	1 (2)	N.S.
	Organic (16)	11 (27)	$Chi^2 = 6.1$	0	

Pleasant events occurred significantly more often in the organic group compared with the functional group.

Chi square (Yates correctn.) = 6.1, $p < 0.02$

TABLE 119: Nos. of ADVERSE events and difficulties experienced in the six months prior to interview

DIAGNOSIS			EVENTS (no. of patients)			DIFFICULTIES (no. of patients)		
Upper GI	Functional	(11)	9	(5)	N.S.	28	(10)	N.S.
	Organic	(9)	1	(1)		20	(8)	
Lower GI	Functional	(37)	30	(14)	N.S.	97	(33)	N.S.
	Organic	(7)	11	(5)		11	(5)	
TOTAL	(64)							
	Functional	(48)	39	(19)	(40%)	125	(43)	(90%)
	Organic	(16)	12	(6)	(38%)	31	(13)	(81%)

No significant differences were found in the number of events and difficulties between the two diagnostic groups or in the numbers of patients experiencing adverse events and difficulties.

TABLE 120: Nos. of patients experiencing ADVERSE events and difficulties in the six months prior to interview

DIAGNOSIS			No Event No Difficulty	Events and Difficulties (no. of patients)	No Events but Difficulties
Upper GI	Functional	(11)	1	5	5
	Organic	(9)	1	1	7
Lower GI	Functional	(37)	4	14	19
*	Organic	(7)	1	4	1
TOTAL:	Functional	(48)	5	19	24
*	Organic	(16)	2	5	8

Chi square - N.S.

* One patient in the lower GI organic group experienced 3 adverse events without any long-term difficulties and was the only patient in the study so classified.

Chi square analysis revealed no significant differences between the functional and organic groups.

(B) QUALITATIVE ASSESSMENT

Each situation (event (E) or long-term difficulty (D)) was classified as previously described as being either an event or a long-term difficulty.

The rating categories used to assess the contextual characteristics of each situation are defined by 6 DIMENSIONS.

L = Personal loss
T = Threatening situation
A = Anti-social act
H = Hopeless situation
U = Uncertainty of outcome
C = Choice of action (conflict)

N.B.

1. Situations which did not score in any of these dimensions were excluded from further consideration.

2. Situations which were "dependent", i.e. the result of the patient's own action and may have produced a state of anxiety or depression, would be later excluded from further analysis.

3. Since there are 6 independent categories for any situation, a priori there are 64 possible combinations. In practice, only 52 different patterns are seen, many of which are rare. Accordingly, only the common combinations are of immediate relevance.

4. Minor stresses defined situations with only ONE or TWO dimensions excluding loss (L), threat (T), (A,H) and (C,H) but including pleasant situations.

5. WEIGHTING of major stresses was achieved using a score of 2 for dimensions (L), (T), (A,H) and (C,H).

TABLE 121: FREQUENCY OF THE DIFFERENT COMBINATIONS OF CHARACTERISTICS OF LIFE SITUATIONS

UPPER GI FUNCTIONAL GROUP (N = 11)

Combinations	No. of subjects (EVENT)	(DIFFICULTY)	No. of such EVENTS	No. of such DIFFICULTIES
C, H, T	-	2	0	3
C, U	-	1	0	1
C, H	-	2	0	2
H, T	1	2	1	2
U, H	1	-	1	0
U, A	1	-	1	0
H, L	1	-	1	0
C	1	3	1	4
U	-	1	0	2
H	-	7	0	11
A	1	-	1	0
T	-	1	0	1
Minor Threat (MIN)	2	2	3	2
TOTALS	5	10	9	28

Minor threat describes a situation whose score is too low to score T.

TABLE 122: FREQUENCY OF THE DIFFERENT COMBINATIONS OF CHARACTERISTICS OF LIFE SITUATIONS

UPPER GI ORGANIC GROUP (N = 9)

Combinations	No. of subjects (EVENT)	(DIFFICULTY)	No. of such EVENTS	No. of such DIFFICULTIES
C, H	-	2	0	4
U, T	-	1	0	1
C	-	2	0	2
U	-	1	0	1
H	1	5	1	7
Minor Threat (MIN)	-	2	0	5
TOTALS	1	8	1	20

TABLE 123: FREQUENCY OF THE DIFFERENT COMBINATIONS OF CHARACTERISTICS OF LIFE SITUATIONS

LOWER GI FUNCTIONAL GROUP (N = 37)

Combinations	No. of subjects (EVENT)	(DIFFICULTY)	No. of such EVENTS	No. of such DIFFICULTIES
C, H, A, T	-	1	0	1
C, U, T	-	2	0	2
C, H, T	1	3	1	5
C, U	1	2	1	2
C, L	1	-	1	0
C, H	-	7	0	9
C, T	1	1	1	1
U, T	2	2	2	2
H, T	-	2	0	2
A, T	1	-	1	0
U, A	1	-	1	0
C	3	10	3	12
H	2	25	2	42
T	3	1	4	2
Minor Threat (MIN)	9	14	13	17
TOTALS	14	33	30	97

TABLE 124: FREQUENCY OF THE DIFFERENT COMBINATIONS OF CHARACTERISTICS OF LIFE SITUATIONS

LOWER GI ORGANIC GROUP (N = 7)

Combinations	No. of subjects (EVENT)	(DIFFICULTY)	No. of such EVENTS	No. of such DIFFICULTIES
C, H, T	-	1	0	1
C, U	-	1	0	1
C, A	1	-	1	0
H, T	-	1	0	1
C	2	3	2	3
H	-	3	0	4
A	1	-	1	0
Minor Threat (MIN)	5	1	7	1
TOTALS	5	5	11	11

TABLE 125: MINOR STRESSES EXPERIENCED DURING THE PREVIOUS SIX MONTHS

(Non-anxiety provoking situations)

Events and difficulties which were considered 'independent', i.e. non-anxiety provoking and did not lead to an anxiety or depression state, were termed MINOR STRESSES and included pleasant situations.

DIAGNOSIS			MINOR STRESSES			
			No.	Mean	SEM	
Upper GI	Functional	(11)	24	2.18	0.58	N.S.
	Organic	(9)	21	2.33	0.37	
Lower GI	Functional	(37)	97	2.62	0.30	N.S.
	Organic	(7)	32	4.57	1.48	
TOTAL						
	Functional	(48)	121	2.52	0.26	N.S.
	Organic	(16)	53	3.31	0.65	

No significant differences were observed between or within the groups on an analysis of variance (F test).

TABLE 126: DIFFUSE SOCIAL SUPPORT

DIAGNOSIS			PRESENT (1)	ABSENT (0)	
Upper GI	Functional	(11)	6	5	N.S.
	Organic	(9)	8	1	
Lower GI	Functional	(37)	28	9	N.S.
	Organic	(7)	6	1	
TOTAL					
	Functional	(48)	34	14	N.S.
	Organic	(16)	14	2	

No significant differences in diffuse social support were found between or within the group using CHI^2 analysis.

TABLE 127: CLOSE SOCIAL SUPPORT (CONFIDANTS)

DIAGNOSIS			PRESENT (1)	ABSENT (0)	
Upper GI	Functional	(11)	6	5	N.S.
	Organic	(9)	6	3	
Lower GI	Functional	(37)	21	16	N.S.
	Organic	(7)	4	3	
TOTAL					
	Functional	(48)	27	21	N.S.
	Organic	(16)	10	6	

No significant differences were found in close social support either between or within the groups on chi square analysis.

Combining the two sources of social support, the total degree of support can be expressed by the mean ie. $\frac{\text{diffuse + social}}{2}$

TABLE 128: TOTAL (COMBINED) SOCIAL SUPPORT

DIAGNOSIS			PRESENT	ABSENT	
Upper GI	Functional	(11)	6	5	N.S.
	Organic	(9)	7	2	
Lower GI	Functional	(37)	24	13	N.S.
	Organic	(7)	5	2	
TOTAL					
	Functional	(48)	30	18	N.S.
	Organic	(16)	12	4	

No significant differences were observed either within or between the groups using chi square analysis.

CURRENT MAJOR SITUATIONS

These major stresses likely to provoke emotional responses are defined by the following patterns of both events and difficulties and scored as follows:

C.H.A.T.	(5)	L.C.	(3)	T.U.	(3)		
C.H.U.T.	(5)	L.H.	(3)	T.H.	(3)	C.H.	(2)
C.U.T.	(4)	L.A.	(3)	T.C.	(3)	A.H.	(2)
C.H.T.	(4)	L.U.	(3)	T.A.	(3)		

The resulting scores WEIGHTED "MAJOR" STRESS was assessed in the diagnostic groups.

TABLE 129: Diagnosis v. Weighted "Major" Stresses during the previous six months

			Nos. patients scoring	No. stresses	Mean score		SEM	Significance
Upper GI	Functional	(11)	6	7	2.55		0.69	N.S.
	Organic	(9)	3	5	1.22		0.70	
Lower GI	Functional	(37)	14	29	2.30		0.37	N.S.
	Organic	(7)	2	2	1.00		0.65	
TOTAL								
	Functional	(48)	20	36	2.35	±	0.38	Chi^2 = N.S.
	Organic	(16)	5	7	1.23	±	0.47	t = 2.06 p = 0.05

No significant difference was observed between the functional and organic groups indicating that situations recognised as anxiety provoking scored similarly in the functional group and in the organic group. The proportion of patients experiencing such situations (39%) was also similar in the two groups.

TABLE 130: TOTAL MAJOR STRESSES (Past and present)

Diagnosis		Score	Mean	SEM
Upper GI	Functional (11)	51	4.64	1.02
	Organic (9)	26	2.89	1.10
Lower GI	Functional (37)	139	3.76	0.56
	Organic (7)	17	4.43	0.87
TOTAL (64)				
	Functional (48)	190	3.96	0.49
	Organic (16)	43	2.69	0.71

Analysis of variance revealed no significant differences either between or within the groups. All major stresses as previously defined were recorded including those experienced prior to the six month period under study.

TABLE 131: TEMPORAL RELATIONSHIPS OF PSYCHIATRIC ILLNESS, MAJOR STRESSES AND BOWEL DISORDER

	FUNCTIONAL GROUP (48)	Significance	ORGANIC GROUP (16)
	Score = s, No. of patients = n, Mean score + SEM		
Major stresses Pre onset (A)	s = 124, 2.58 ± 0.35	N.S.	s = 27, 1.69 ± 0.70
Major stresses Post onset (B)	s = 66, 1.38 ± 0.26	N.S.	s = 16, 1.00 ± 0.33
(A - B)	s = 58, 1.21 ± 0.38	N.S.	s = 11, 0.69 ± 0.83
Anxiety state Pre onset	n = 14	$Chi^2 = 4.4$ $p < 0.05$	n = 0
Depressive state Pre onset	n = 10	N.S.	n = 0
Anxiety state Post onset	n = 10	N.S.	n = 0
Depressive state Post onset	n = 8	N.S.	n = 2

(See Table 133)

TABLE 132: TEMPORAL RELATIONSHIPS OF PSYCHIATRIC ILLNESS, MAJOR STRESSES AND BOWEL DISORDER

	FUNCTIONAL GROUP (48)	Significance	ORGANIC GROUP (16)
	Score = s, No. of patients = n, Mean score + SEM		
Weighted Major stresses Provoking anxiety states Pre onset (x)	s = 32, 0.67 ± 0.15	N.S.	s = 4, 0.25 ± 0.19
Weighted Major stresses Provoking anxiety states Post onset (y)	s = 13, 0.27 ± 0.09	N.S.	s = 4, 0.25 ± 0.17
(x - y)	s = 19, 0.4 ± 0.17	t = 2.35 p < 0.02	s = 0, 0.00
I Weighted major stress and/or anxiety state Pre onset	n = 24	Chi^2 = 5.5 p < 0.02	n = 2
II Weighted major stress and/or anxiety state Post onset	n = 18	N.S.	n = 5

(See Table 133)

TABLE 133: TEMPORAL RELATIONSHIPS OF PSYCHIATRIC ILLNESS, MAJOR STRESSES AND BOWEL DISORDER

(KEY TO TABLES : 131 + 132)

I — If anxiety state is present before onset or anxiety provoking situation before onset, then the patient is scored 1, otherwise 0.

II — If anxiety state is present after onset, or anxiety provoking situation after onset, then the patient is scored 1, otherwise 0.

(A - B) — Stresses occurring before onset MINUS stresses after onset.

If stress pre-onset is greater than post-onset, then providing the difference is significant ($F > 0$), a cause and effect can be postulated.

E.G. If IBS causes stress then POST > PRE

If stress causes IBS then PRE > POST

(x - y) — Anxiety-provoking stresses before onset MINUS stresses after onset. Again if the pre-onset stress is greater than the post-onset stress, in the functional group compared with the organic, then this would support the hypothesis that stress induces the IBS.

TABLE 134: Current psychiatric illness[1] and anxiety provoking life situations[2]

Psychiatric state	Life situation	Functional bowel disorder (M=17, F=31)	Organic bowel disorder (M=8, F=8)
Not psychiatrically ill	provoking situation absent	22 (46%)	11 (69%)
	provoking situation(s) present	6 (12.5%)	4 (25%)
Psychiatrically ill*	provoking situation absent	11 (23%)	1 (6%)
	provoking situation(s) present	9 (19%)	0

* $Chi^2 = 5.3$, $p < 0.05$

1. Present or absent during the past 6 months according to RDC or ID criteria.

2. Includes only the following types of situations:
CHAT, CUHT, CHT, CAT, CUT, UHT, CUA, LH, CH, CL, UH, UA, CA.

TABLE 135: Anxiety provoking situation(s) and psychiatric illness before and after the onset of bowel disorder

Psychiatric state	Life situation	Functional bowel disorder (M=17, F=31)	Organic bowel disorder (M=8, F=8)
First episode of psychiatric illness[1] prior to bowel disorder	Anxiety provoking situation(s)[2] present in the 6 months prior to bowel disorder	7 (14.6%)	0
	No anxiety provoking situation in the 6 months prior to bowel disorder	8 (16.7%)	0
$Chi^2 = 4.9$, $p < 0.05$			
First episode of psychiatric illness post bowel disorder	Prior anxiety provoking situation present	5 (10.4%)	0
	No prior anxiety provoking situation present	6 (10.4%)	2 (12.5%)
No known episode of psychiatric disorder	Prior anxiety provoking situation present	5 (10.4%)	2 (12.5%)
	No prior anxiety provoking situation present	17 (35.4%)	12 (75%)

* Based on limited data for 64 patients. Both psychiatric illnesses and anxiety-provoking situations are underestimated but there is no bias between functional and organic disorder.

1. RDC criteria irrespective of diagnosis. All known episodes taken into account.

2. Includes only the following types of situations:
CHAT, CUHT, CHT, CAT, CUT, UHT, CUA, LH, CH, CL, UH, UA, CA.

Analysis of variance revealed significant differences between the groups with respect to psychiatric illness preceding the onset of bowel disorders and stresses prior to psychiatric illness preceding the onset of bowel disorders.

TABLE 136: Anxiety provoking Stress[1], Psychiatric illness[2] and Bowel disorders

Patients experiencing	FUNCTIONAL	(lower GI)	ORGANIC	(lower GI)
Either major stress or psychiatric illness preceding bowel disorder	25	(17)	2	(0)
Patients experiencing Bowel disorder preceding either psychiatric illness or major stress	6	(5)	2	(1)
Patients without either major stress or psychiatric illness	17	(14)	12	(6)
TOTAL	48	(37)	16	(7)

Chi square (Yates) = 6.2, df = 2, $p < 0.02$
(F v O)

1. Includes only the following types of situations:
   CHAT, CUHT, CHT, CAT, CUT, UHT, CUA, LH, CH, CL, UH, UA, CA.

2. RD Criteria.

PSYCHIATRIC AND LIFE SITUATION DATA IN 38 FEMALE HOSPITAL REFERRALS AND 38 CONTROLS

TABLE 137: THE DIAGNOSTIC CATEGORIES IN THE 76 WOMEN

Patients (38)	Upper GI	Functional	(5)	'Dyspepsia'	(5)
		Organic	(4)	Mouth ulcer	(1)
				Duodenal ulcer	(3)
	Lower GI	Functional	(25)	Irritable bowel	(25)
		Organic	(4)	Coeliac disease	(1)
				Crohn's enteritis	(1)
				Proctocolitis	(2)
Controls (38)	Control 'Functional'		(30)		
	Control 'Organic'		(8)		

TABLE 138: CURRENT PSYCHIATRIC ILLNESS (RDC) IN THE 76 WOMEN

Diagnosis	RDC (Caseness)	1	2	3	4	5	6	7	Significance
Functional (30)	(12)	2	3	2	0	0	2	3	$chi^2 = 4.0$ $p < 0.05$
Control F. (30)	(5)	1	2	1	0	0	0	1	
Organic (8)	(1)	0	0	1	0	0	0	0	N.S.
Control O. (8)	(1)	0	1	0	0	0	0	0	

TABLE 139: CURRENT AND/OR PREVIOUS PSYCHIATRIC ILLNESS (RDC) IN THE 76 WOMEN

Diagnosis	Present		Absent
Functional (30)	18	(Yates) $Chi^2 = 6.9$ p 0.01	12
Control F. (30)	7		23
Organic (8)	2	N.S.	6
Control O. (8)	1		7

TABLE 140: ANXIETY AND DEPRESSION LINEAR ANALOGUE RATINGS (0-20) (Mean + SEM) IN THE 76 WOMEN

Diagnosis	Anxiety	Depression
Functional (30)	7.1 ± 0.60	4.9 ± 0.53
	t = 3.4, p < 0.01	N.S.
Control F. (30)	4.8 ± 0.60	4.2 ± 0.52
Organic (8)	5.0 ± 0.69	3.9 ± 0.90
	t = 3.1, p < 0.01	N.S.
Control O. (8)	7.8 ± 0.59	4.9 ± 0.55

TABLE 141: SOCIAL SUPPORT IN THE 76 WOMEN

Diagnosis	Close (+)	(-)	Diffuse (+)	(-)
Functional (30)	18	12	19	11
Control F. (30)	22	8	15	15
Organic (8)	7	1	7	1
Control O. (8)	3	5	5	3

Chi square analysis - N.S. ((+) = PRESENT, (-) =ABSENT)

TABLE 142: MINOR STRESSES EXPERIENCED BY THE 76 WOMEN DURING THE PREVIOUS SIX MONTHS

Diagnosis	No. of minor stresses	Mean + SEM
Functional (30)	74	2.47 ± 0.33
Control F. (30)	73	2.43 ± 0.23
Organic (8)	34	4.25 ± 1.35
Control O. (8)	19	2.38 ± 0.37

Analysis of variance N.S.

TABLE 143: TOTAL MAJOR STRESSES EXPERIENCED BY THE 76 WOMEN DURING THE PREVIOUS SIX MONTHS

Diagnosis	Major Stresses		
	Score	Mean	SEM
Functional (30)	95	3.17	0.47
Control F. (30)	82	2.73	0.49
Organic (8)	30	3.75	1.25
Control O. (8)	28	3.50	0.68

Analysis of variance - N.S.

TABLE 144: FREQUENCY OF THE DIFFERENT COMBINATIONS OF CHARACTERISTICS OF LIFE SITUATIONS

FUNCTIONAL GROUP (n = 30)

Combinations	No. of subjects (EVENT)	(DIFFICULTY)	No. of such EVENTS	No. of such DIFFICULTIES
C, U, H, T	-	1	0	1
C, H, T	-	2	0	3
U, H, T	-	1	0	1
C, U, H	-	1	0	1
C, U, T	-	2	0	2
C, H	-	5	0	5
L, H	-	2	0	2
U, T	2	2	2	2
H, T	-	1	0	1
C, U	-	2	0	2

CONTROL FUNCTIONAL GROUP (n = 30)

C, A, T	-	1	0	1
L, H, T	-	2	0	2
U, H, T	-	1	0	1
C, U, T	-	2	0	2
C, H, T	-	1	0	1
C, H	-	2	0	2
H, T	-	3	0	3
C, T	-	1	0	1
A, T	-	1	0	1

WEIGHTED MAJOR STRESSES (experienced during the previous six months) likely to provoke emotional responses were defined as follows and scored by the following weighting method.

C.U.H.T.	(5)	C.U.H.	(3)	C.H.	(2)
L.H.T.	(5)	L.H.	(3)	A.H.	(2)
U.H.T.	(4)	U.T.	(3)		
C.H.T.	(4)	H.T.	(3)		
C.A.T.	(4)	C.T.	(3)		
C.U.T.	(4)	A.T.	(3)		

TABLE 145: WEIGHTED MAJOR STRESS IN 30 FEMALES WITH A FUNCTIONAL DISORDER COMPARED WITH MATCHED CONTROLS

GROUPS	WEIGHTED MAJOR STRESS			
	Nos. Scoring	Nos. Stresses	Mean Score	SEM
Functional (30)	13	19	2.0	± 0.50
Control (30)	9	15	1.73	± 0.61

Though the scores were greater in the functional group, the difference did not achieve statistical significance. However, the difference in the number and severity of major stresses Pre-onset minus Post-onset was significantly greater comparing functional with the control group.

TABLE 146: TEMPORAL RELATIONSHIPS OF PSYCHIATRIC ILLNESS, MAJOR STRESSES AND BOWEL DISORDERS

PATTERN	FUNCTIONAL (30) Score/Nos. pts. 's'	'n'	Significance	CONTROL (30) Score/Nos. pts. 's'	'n'
Anxiety state Pre onset	n = 7		N.S.	n = 3	
Depressive state Pre onset	n = 7		N.S.	n = 3	
Anxiety state Post onset	n = 7		N.S.	n = 1	
Depressive state Post onset	n = 7		N.S.	n = 2	
Major stress Pre onset (A)	s = 68	(Mean ± SEM) (2.27) (± 0.41)	N.S.	s = 37	(Mean ± SEM) (1.23) (± 0.40)
Major stress Post onset (B)	s = 27	(0.90) (± 0.22)	N.S.	s = 45	(1.50) (± 0.34)
* (A - B)	s = (+) 41	(Mean ± SEM) (1.37) (± 0.46)		s = (-) 8	(Mean ± SEM) ((-)0.27) (± 0.55)

* Student's 't' test: $t = 2.3$, $p < 0.05$

* (See Table 133 for KEY)

TABLE 147: TEMPORAL RELATIONSHIPS OF PSYCHIATRIC ILLNESS, MAJOR STRESSES AND BOWEL DISORDERS

PATTERN	FUNCTIONAL (30) Score/Nos. pts. 's'	'n'	Significance	CONTROL (30) Score/Nos. pts. 's'	'n'
Weighted major Stress provoking Anxiety Pre onset (X)	s = 19	(Mean ± SEM) (0.63) (± 0.20)	N.S.	s = 9	(Mean ± SEM) (0.30) (± 0.16)
Weighted major Stress provoking Anxiety Post onset (Y)	s = 4	(Mean ± SEM) (0.13) (± 0.09)	N.S.	s = 8	(Mean ± SEM) (0.27) (± 0.12)
* (X - Y)	s = 15	(Mean ± SEM) (0.50) (± 0.22)		s = 1	(Mean ± SEM) (0.03) (± 0.21)
Weighted major stress and/or anxiety state Pre onset	n = 14		N.S.	n = 7	
Weighted major stress and/or anxiety state Post onset	n = 10		N.S.	n = 7	
Subjects without either major stress or psychiatric illness	n = 11		N.S.	n = 15	

* Student's 't' test: $t = 5.0$, $p < 0.001$

N.B. Pre and Post for CONTROL subjects was established using the time period se the duration of symptoms in the functional group.

(See Table 133 for KEY)

TABLE 148: Psychiatric illness and anxiety provoking situations in females with bowel disorders and matched controls

	Functional (N = 30)	Control Functional (N = 30)	Organic (N = 8)	Control Organic (N = 8)
1. Current psychiatric illness *	12	5	1	1
2. At least one anxiety provoking situation in the 6 months prior to interview **	6	8	3	4

* Sign test: $p < 0.05$ (F.V. CF)

** N.S.

1. RDC or ID criteria

2. Includes only the following types of situations:
CHAT, CUHT, CHT, CAT, CUT, UHT, CUA, LH, CH, CL, UH, UA, CA.

FUNCTIONAL DISORDERS OF THE ALIMENTARY TRACT

DISCUSSION

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GENERAL PRACTICE POPULATION (TABLES 1-2)

During the study period 142 patients completed questionnaires in the age group 18 - 60 a group comprising 22% of the practice patients within this age group. In order to avoid biased patient selection it was planned that 100 consecutive females and 50 consecutive males would be recruited into the study. A deliberate attempt to minimise the waiting time within the surgery was undertaken by recruiting patients outwith periods of peak attendance. In so doing however it is possible that patients presenting with less severe symptoms rather than patients with more severe symptoms would have been recruited. The demographic data revealed that the GP study group comprised patients, 98% of whom were within the social classes, 3,4 and 5, a proportion not dissimilar to that of the general practice total population; 14% of the males interviewed and 15% of the husbands of females interviewed were unemployed. Only 10 patients (6.6%) declined to complete the questionnaire. Given these reservations the study group comprised a representative sample of patients requesting consultation by their general practitioner.

HOSPITAL CLINIC POPULATION (TABLES 3-5)

During the study period, 159 patients attending the clinic were aged between 18 and 60 years of whom 139 were approached and invited to complete the questionnaires. Only 5 patients declined to complete the questionnaire;

84% of all patients aged 18 - 60 years were recruited into the study. A similar proportion of patients referred to each of 3 Consultants was recruited in order to avoid a biased selection of patients. One-third of patients recruited into the study were of social class 1 or 2 and one-third from social class 4 or 5. The sex ratio confirmed a female preponderance (M/F = 2/3) and females were significantly younger than males mean age 35 years v. 41 years. Of the 134 patients recruited into the study, 80 (60%) were invited to participate in the second limb of the study of whom 80% were later interviewed (Table 4); 8 patients declined to be interviewed, in 2 patients permission from the general practitioner was not forthcoming and in a further 6 patients, interviews could not be undertaken within 3 months of the date of referral to the hospital clinic. The demographic data from patients admitted into the second limb of the study for psychiatric assessment and life situation inventories did not differ significantly from the patients recruited into the first limb of the study with respect to sex ratio, age, marital status or social class. With these reservations therefore the hospital clinic group was considered an unbiased and representative sample of patients within the age group 18 - 60 referred to the clinic by their general practitioner.

DIAGNOSTIC CODING

GENERAL PRACTICE POPULATION (TABLES 6-11)

The patients were grouped with respect to alimentary problems, psychiatric problems and all other problems. Using these three diagnostic groups no significant differences in marital status, social class or duration of symptoms was found (Tables 8-10). Similarly the number of previous consultations in the preceding six months because of similar symptomatology was not significantly different between the three groups (Table 11).

Symptoms suggesting an alimentary problem, genito-urinary problem or psychiatric problem accounted for 48% of all requests for a general practitioner consultation (Table 6). Alimentary disorders and psychiatric disorders accounted for 10% and 13% respectively of self-referrals to the general practitioner. With one exception, the psychiatric group were all females. Problems concerning the genito-urinary system comprised 25% of consultations and the majority were requests from females for contraceptive advice.

HOSPITAL CLINIC POPULATION (TABLES 36-41)

A retrospective analysis of the medical case records was undertaken in all 134 patients in the study group at a

date not less than 12 weeks after the initial clinic consultation. Details of the gastro-intestinal questionnaire, psychiatric questionnaire, alcoholism questionnaire, psychiatric assessment and life situation inventory were not available so that any bias was avoided in the independent assessment of each out-patient. The principal cause of gastro-intestinal symptoms for which consultation had been requested was determined for each patient (Table 36). The diagnosis was made along conventional lines taking into account the investigations undertaken and the Consultant's assessment. When no evidence of an organic disorder was found the disorder was coded as functional and classified as either upper abdominal or lower abdominal with respect to principal symptomatology. It could be argued that longterm follow-up is necessary before organic disease can be safely excluded. Previous studies have shown however that when a diagnosis of a functional disorder of the alimentary tract is made after appropriate investigations, the subsequent discovery of an organic cause will emerge in fewer than 5% of patients - [70, 167, 199].

This study has shown that 72% of all patients aged between 18 and 60 years referred by their general practitioner to a gastro-intestinal clinic have no evidence of organic disease when assessed independently 12 weeks after the initial consultation and further investigations. In this group of patients three-quarters had symptoms referrable to the lower gastro-intestinal tract (the irritable bowel syndrome) and a

quarter had symptoms referrable to the upper gastro-intestinal tract (functional dyspepsia) (Table 38). Previous studies indicate that functional disorders of the alimentary tract account for 50% of all gastro-intestinal out patient referrals - 35, 63. In the same Edinburgh GI clinic, an earlier survey identified a functional disorder in 31% of all referrals - 34. However, the latter study included many elderly patients and referrals from other consultants, the majority of whom had organic disease. Less than 5% of patients with an irritable bowel present after the age of 60 years - 63. In the present study, 45% of the 244 general practitioner referrals were outwith the age limits of the study. The proportion of all general practitioner referrals, irrespective of age, with a functional disorder (40%) is therefore comparable to that previously reported - 34.

The majority of patients with organic disorders of the upper alimentary tract had peptic ulceration and of the lower intestinal tract had inflammatory bowel disease. The number and nature of the clinical investigations necessary to establish the final diagnosis was similar in the two groups (Table 37). In patients with upper gastro-intestinal disorders, the duration of symptoms prior to clinic referral was significantly greater in the organic group (Table 41). In patients with lower gastro-intestinal disorders the duration of symptoms was shorter in the organic group though this difference was not statistically significant. No significant differences

between the 4 diagnostic groups were found with respect to age, sex, marital status or occupational status (Tables 38-40).

ALIMENTARY SYMPTOMATOLOGY

Questionnaire studies of alimentary symptoms have previously been undertaken in attempts to characterise gastro-intestinal disorders including dyspepsia, the irritable bowel syndrome, inflammatory bowel disease and uncomplicated diverticular disease of the colon - [36, 37, 49, 50, 51, 55, 56, 58, 65, 66, 144, 245, 246]. Several different formats have been used including self-reporting inventories - [37, 71, 245, 246] inventories completed by a non-medical assistant - [51,55] and inventories completed by physicians during a clinical interview - [36, 49, 50, 56, 58, 65, 66]. It has been shown that data elicited by non-medical staff are as reliable as those elicited by medical staff - [51]. The use of a structured questionnaire can help in clarifying the diversity and severity of symptomatology in many alimentary disorders particularly functional disorders. It could be argued that a full history and examination should be performed on every patient who presents to the doctor. Without a structured questionnaire format, however, this is often not the case in routine clinical practice. Many people with functional symptoms do not seek medical advice and those who do, often select which of their symptoms to present to their doctors - [57]. Patients may complain of symptoms which are current at time of presentation and

only subsequently admit to further symptomatology. Furthermore patients have a preconceived concept of normality and only complain of deviations from such concepts. Similar problems are also experienced by the clinician and may account for diagnostic errors due to an erroneous data base upon which stereotypes of different alimentary disorders is based - 55.

Functional disorders of the gastro-intestinal tract lack clearcut defining characteristics; nonetheless they do have a set of symptoms and signs which commonly characterise the disorder. With increasing experience most clinicians manage to identify such disorders using an implicit description of the disorder in the absence of an explicit description. Tests which have assessed the consistency and concordance of individual clinicians in the diagnosis of functional bowel disorders have shown a considerable lack of agreement between clinicians - 85. Thus in a study involving 5 independent consultants and 100 case records of patients with the irritable bowel, 20 of which were replicated to test consistency, in only 50% of patients was a unanimous diagnosis of the irritable bowel achieved; in 25 patients there was unanimity in excluding the diagnosis of the irritable bowel and in the remainder, the observers disagreed - 85.

Certain alimentary symptoms e.g. gastro-intestinal bleeding, strongly suggest the presence of organic disease and merit extensive investigation. Many patients with organic diseases of the alimentary tract

however do not present with such obvious pointers to the clinician. The use of a self-reporting format to characterise the diversity and severity of non-specific alimentary symptoms avoids the possibility of observer bias and facilitates data collection in large numbers of patients. The self-reporting inventory of alimentary symptoms used in this study comprised those symptoms conventionally regarded as helpful in characterising the common gastro-intestinal complaints of dyspepsia, abdominal pain and change in bowel habit - [36, 56, 57, 58, 215]. Though patients' recall of symptoms is imperfect, there is a surprisingly close agreement between the recall of alimentary data and a day-to-day diary record of such data - [214]. However in this study, symptoms were only considered of significance if they had been experienced at least once each month during the previous six months since non-specific symptoms occurring less frequently than monthly are unlikely to be of clinical significance.

ALIMENTARY SYMPTOMS IN THE GENERAL PRACTICE GROUP (TABLES 12-22)

Psychiatric symptoms and alimentary symptoms accounted for 13% and 10% respectively of the total requests for consultations in the study group. Of the upper alimentary symptoms, nausea, anorexia, vomiting, acid reflux, globus, heartburn and belching, only nausea was experienced significantly more frequently in patients with alimentary disorders and only globus was experienced more frequently in patients with psychiatric disorders

(Tables 14-15). Globus, a feeling of a lump in the throat, is believed to be a functional disorder of the oesophagus due to a dysmotility of the upper oesophageal sphincter - [49, 71, 247, 248]. In one study, globus occurred significantly more often in patients with the irritable bowel syndrome than matched control subjects - [71]. In another study however, 46% of 146 apparently healthy subjects had at some time experienced the symptom of globus, 96% of whom reported that the symptom occurred during periods of great emotion; many volunteered that it disappeared with crying. No association was found between globus and heartburn - [49]. In the present study, only 5% of the GP group experienced globus at least once each month compared with 16% of patients with a psychiatric problem. (Table 15). This finding is in keeping with conventional wisdom which suggests that globus is a physical manifestation of suppressed emotion. The findings in respect of heartburn are similar to those recorded by others; heartburn occurred at least once a month in 13% and at least once a week in 10.5% of the GP group - [36, 49, 247].

No significant difference in bowel frequency was observed between the 3 subgroups of patients attending their general practitioner (Tables 17-18). The majority of patients opened their bowels 3-6 times each week and only 10% of patients opened their bowels with less than or greater than this frequency. None of the lower alimentary symptoms or urinary symptoms occurred any more frequently in any of the 3 diagnostic subgroups. Urinary

symptoms of urgency, frequency and nocturia were experienced at least monthly by 18%, abdominal distension by 21%, constipation by 13% and diarrhoea by 4% (Table 19). Similar findings have been found in apparently healthy people not seeking health care - 36, 37. Abdominal pain was experienced at least monthly by 16% and occurred significantly more often in the alimentary group compared with the others (Table 20). In the majority (62%), pain was experienced principally in the lower abdomen and in only 21% was pain principally in the upper abdomen (Table 21). In the 108 patients who had experienced abdominal discomfort at some time in the previous 6 months, 74% noted a change in abdominal pain following defaecation, 69% following the passage of rectal flatus and 46% following belching; 41% had experienced a contemporaneous change in bowel habit at times of abdominal pain (Table 22).

Anxiety and stress exacerbated abdominal symptoms significantly more often in the psychiatric group compared with other patients. In total, 63% of patients had noticed that abdominal symptoms were aggravated by stress and anxiety (Table 25). Previous medical consultations because of nervousness had occurred in 39% of the GP attenders a proportion which was not significantly different in the alimentary group compared with the remainder, excluding those in the psychiatric sub group (Table 26).

ALIMENTARY SYMPTOMS IN THE HOSPITAL CLINIC GROUP (TABLES 41-69)

Symptoms were only considered of significance if experienced at least once each month during the six months prior to the study. The duration of symptoms for which hospital consultation was requested was not significantly different in the functional and organic groups; 41% of the functional group and 35% of the organic group had experienced symptoms for one year or less and 39% of the functional group and 65% of the organic group had experienced symptoms for 2 years or more (Table 41). In the upper alimentary disorders however there was a significant increase in duration of symptoms in the organic group compared with the functional using non-parametric tests.

A. UPPER ALIMENTARY SYMPTOMS (Tables 42-49)

48 patients (36%) were found to have upper alimentary disorders of whom 22 (46%) had a functional disorder of the upper alimentary tract (Table 38). The upper alimentary symptoms of nausea, anorexia, vomiting, weight loss, acid reflux, globus, heartburn and belching all occurred as frequently in the upper GI and lower GI groups and in the functional and organic groups. None of these symptoms was observed with any greater frequency in any individual subgroup. In the hospital clinic group, acid reflux, heartburn and globus were experienced at

least once a month by 32%, 29% + 11% respectively. Acid reflux, heartburn and globus were experienced at least once a week by 25%, 23% and 9% respectively (Tables 46-48).

B. LOWER ALIMENTARY SYMPTOMS (Tables 50-69).

Lower alimentary disorders were established in 86 (64%) of the study group of which 75 (87%) were considered functional disorders (Table 38). The frequency of bowel motions was not significantly different in the functional and organic groups though, as expected, it was significantly greater in the lower alimentary group compared with the upper alimentary group (Tables 50-51). Only 8% of the hospital clinic group had a bowel frequency of less than 3 times per week; 16% had bowel frequencies of 3 per day or greater and the majority (76%) had a bowel frequency ranging from 3 times per week to twice per day (Table 51). The lower alimentary symptoms constipation, diarrhoea, tenesmus, pellet-like or ribbon-like stools, urgency of defaecation and the passage of rectal mucus and flatus all occurred as frequently in the upper and lower alimentary groups and in the functional and organic groups (Tables 52-58). Constipation experienced at least once each month was present in 22% when defined as the passage of pellet-like or ribbon-like stools (Table 54); when defined as the frequent desire to strain during defaecation it was observed in 28% of the study group (Table 56).

Abdominal distension was experienced significantly more

often in patients with functional disorders compared with organic disorders; 46% of the functional group experienced abdominal distension at least once a month compared with 22% of the organic group (Table 59). Abdominal pain was experienced at least once a month by 63% of the study group, a proportion not significantly different in the functional or organic groups (Table 63). Of the 119 patients who experienced abdominal pain at some time, 44% experienced pain in the lower half of the abdomen, 31% experienced pain in the upper half of the abdomen and the remainder experienced pain in either the right or left half of the abdomen (Table 64). As anticipated, upper abdominal pain occurred significantly more frequently in the upper GI group and lower abdominal pain in the lower GI group. Pain in the lower half of the abdomen occurred significantly more often in the functional group (Table 64). A change in abdominal pain following defaecation and a change in stool frequency or consistency at times of abdominal pain were both significantly associated with functional disorders (Tables 65,67,69). There was no correlation between the presence of urinary symptoms and the site of the gastro-intestinal disorders (upper or lower) or the nature of the disorder (functional or organic) - (Table 62). Stress or anxiety was found to influence alimentary symptoms in 75% of all patients a proportion not significantly different in the functional and organic groups. Similarly 31% of patients had previously consulted their general practitioner because of anxiety-related symptoms, a proportion similar in both the

functional and organic groups.

No-one doubts that a careful history and examination are vital in establishing a positive diagnosis of a functional bowel disorder - [56-57]. However the symptoms which characterise functional disorders of the bowel are common among subjects not seeking health care and indistinguishable from those occurring in organic diseases of the alimentary tract - [36, 37, 65, 66]. The present study has shown that the occurrence of frequent episodes of abdominal distension, a change in the frequency or severity of abdominal pain after defaecation and a change in the frequency or consistency of bowel motions at times of abdominal pain all occur significantly more frequently in patients with functional disorders (Table 69). Similar findings have been found by others - [56, 58, 245]. Useful as these symptoms are in characterising groups of bowel disorders, such clusters of chronic symptoms do not safely exclude the possibility of organic disease in an individual subject - [65, 245]. Other studies have not used self-reporting questionnaires as in the present study; however the finding of identical results in this study lends validity to the methodology.

CLUSTER ANALYSIS AND DISCRIMINANT FUNCTION OF ALIMENTARY SYMPTOMS (HOSPITAL AND GP GROUPS)

Using cluster analysis techniques, groups of symptoms were identified which occurred together more often than could be expected by chance and the significance of such clusters was expressed using a correlation co-efficient. Figures 3 + 4. In both the GP and hospital study groups, similar clusters of symptoms were found and revealed the expected associations between upper-alimentary symptoms and between lower alimentary symptoms (Tables 32, 81). It was significant that no clustering of both upper and lower alimentary symptoms was observed reflecting the relative independence of certain groups of alimentary symptoms. For instance, there was a close correlation between the symptoms of urinary urgency, urinary frequency and nocturia as would be expected. However this cluster of symptoms could not be correlated with any other groups of either upper or lower alimentary symptoms. Similarly, symptoms of upper alimentary disorders such as nausea and heartburn did not correlate with lower alimentary symptoms such as straining at stool, pellety or ribbon-like stools and tenesmus. The relative contribution of each question in the clusters was assessed using principal components analysis and a differential weighting was undertaken to produce a total score for each of the 5 clusters of symptoms which emerged as being common to both the GP and hospital groups (Tables 82-86). The upper GI symptom clusters comprised (A) belching and relief of abdominal discomfort

after belching and (B) nausea, vomiting, acid reflux, heartburn and belching. The lower alimentary symptom clusters comprised (C) pellety or ribbon-like stools, straining at stool, tenesmus and rectal mucus and (D) abdominal pain changed by defaecation or the passage of rectal flatus and coinciding with changes in bowel habit. The derived symptoms scores did not differ significantly in the functional and organic groups. While the lower alimentary symptom scores were significantly higher in the lower GI group compared with the upper GI group (Tables 84,85) upper alimentary symptom scores were not significantly different in patients with either upper or lower alimentary disorders (Tables 82,83). The urinary tract symptom cluster (E) comprised urinary urgency, frequency and nocturia; urinary symptom scores were not significantly different in the functional and organic groups or upper alimentary and lower alimentary disorders (Table 86).

The frequency with which upper alimentary symptoms was observed in patients with a functional disorder of the lower bowel (irritable bowel syndrome) is similar to that recorded by others. Dyspeptic symptoms were found in 87% of 101 patients with the irritable bowel syndrome - [59]. In a study of 301 apparently healthy people, heartburn was experienced at least once a week by 10% of the study group - [36]. Neither heartburn nor globus have been shown to have any consistent relationship with the irritable bowel syndrome - [49]. In another study however, the symptoms of globus and headache were found

significantly more frequently in irritable bowel patients - [71]. The findings of the present study support the view that both heartburn and globus are common and do not confer any discriminant function in distinguishing patients with functional or organic disorders. The frequency with which globus was reported in the GP psychiatric subgroup however has confirmed the association of globus with emotional distress - [49, 71, 247, 248].

The lower alimentary symptoms which best characterise functional disorders of the lower alimentary tract are abdominal distension, abdominal pain relieved by defaecation and abdominal pain occurring at times of changes in bowel habit (Table 69). The use of derived symptom scores for clusters of these symptoms however has not confirmed their value in reliably distinguishing patients with functional and organic disorders of the lower alimentary tract. Previous studies have shown that the clustering of lower alimentary symptoms can help distinguish patients with the irritable bowel syndrome - [56, 245]. Though these same symptoms of gut dysfunction are highly discriminating between irritable bowel syndrome and peptic ulcer patients, this is not the case between patients with irritable bowel syndrome and inflammatory bowel disease - [58]. Using a similar questionnaire of lower alimentary symptoms, 33% of patients with ulcerative colitis in remission fulfilled the criteria of an irritable bowel syndrome - [65]. In another study the same symptoms were assessed in 97 out-

patients referred for a barium enema; symptoms suggesting the irritable bowel were reported as frequently in those with a normal barium enema as those with uncomplicated diverticular disease - [66]. Useful as these symptoms are in distinguishing groups of patients with functional and organic disorders of the intestinal tract, they are no substitute for a careful examination and investigation of individual patients presenting with non-specific alimentary complaints.

OTHER EPIDEMIOLOGICAL FACTORS (HOSPITAL AND GP GROUPS)

A. CEREAL FIBRE INTAKE AND LAXATIVE USE

A conscious effort to take a breakfast cereal with a high roughage content most days or weeks was made by 38% of the GP study group and 49% of the hospital study group (Tables 23,61). Laxatives were taken at least once a month by only 3% of the GP group compared with 8% of the hospital group (Table 19,60). Daily dietary fibre intake might be expected to correlate with the regular intake of a breakfast cereal high in fibre. No association was found between either laxative use or infrequent cereal fibre intake and functional disorders of the GI tract, a finding at variance with previous reports - [36, 60, 143].

B. Cigarette smoking

Regular cigarette smoking was identified in 50% of the GP

study group and 42% of the hospital clinic group (Tables 28,71). Smoking was not associated with any specific GP sub group. Smoking was not found any more often in the functional group compared with organic or with the upper alimentary group compared with the lower alimentary group. These findings are not surprising since there is little firm epidemiological data to support a causal link between cigarette smoking, peptic ulceration, gastro-intestinal disorders or psychiatric illness.

C. Atopy and allergies

The proportion of patients with atopic manifestations including asthma, eczema or rhinitis was identical in the GP and hospital clinic groups eg. only 6% of each group had asthma and 6% eczema (Tables 24, 70). There was no significant difference in the prevalence of atopic manifestations in patients with functional and organic disorders. The occurrence of specific food intolerance and food allergy in patients with functional bowel disorders is uncommon and unlikely to involve more than 5% of patients - [138-140]. In a study of 100 patients with food intolerance, 93% had pre-existing allergic conditions - [132]. The prevalence of atopic disorders recorded in this study supports the view that food allergy is an uncommon factor in the irritable bowel and is at variance with the prevalence found by some workers - [133]. The methodology of clinical trials into food allergy in the irritable bowel syndrome is contentious

and probably accounts for the marked over-diagnosis recorded in some studies - [140-141].

D.Absenteeism

It is common anecdotal experience that patients with psychiatric disorders or functional disorders exhibit absenteeism to a greater extent than other patients. In the GP population, only 6% of those attending their general practitioner had lost a significant number of working days because of abdominal symptoms (Table 29). The proportion of patients was similar in the psychiatric subgroup compared with the alimentary or other subgroups. In contrast, 23% of patients attending the hospital clinic had lost a significant number of working days because of alimentary symptoms (Table 75). This difference however probably reflects differences in the severity of symptomatology. There was no significant difference between patients with functional and organic disorders with respect to the number of working days lost due to alimentary symptoms. This study has shown that functional disorders produce the same degree of incapacity with respect to working days lost as do organic diseases of the alimentary tract. It seems likely that other factors associated with absenteeism are operating in both the functional and organic groups, independent of the nature of the complaint contributing to incapacity.

ALCOHOLISM SCREENING (MAST) IN THE HOSPITAL AND GP GROUPS (TABLES 31,78)

Heavy alcohol consumption is a well recognised cause of certain alimentary symptoms particularly dyspepsia and diarrhoea - [144-146]. In one study of 96 patients with unexplained abdominal pain, 13% were found to have a previously unrecognised alcohol problem - [23]. In the same general practice population from which the present GP study group was collected, the prevalence of problem drinkers had previously been assessed from medical case records at 1% of the practice population - [147]. This study has shown that within this general practice, using the MAST with a cut-off score of 5, 13% were identified as problem drinkers (Table 31). Total MAST scores closely correlate with previous serious alcohol misuse, lifetime daily average consumption and duration of drinking problem - [225-227].

By extrapolation, this study has shown that problem drinkers are much more likely to seek medical consultation than subjects without an alcohol problem; similar findings within the same general practice population have previously confirmed this observation - [147]. There was no significant difference in the distribution of MAST scores in the three GP subgroups (Table 31). Alcoholism was significantly more frequent in males and in the unemployed; over three-quarters of the problem drinkers were males despite the fact that males comprised only 30% of the GP study group. No

association was found between MAST scores of 5 or greater and any of the alimentary symptoms in the GP study group. In the hospital clinic group, 15% of patients were identified as problem drinkers using the same cut-off score of 5 or greater (Table 78). Once again three-quarters of the problem drinkers were males though males comprised only 41% of the hospital group. In contrast to the GP study group, problem drinkers were significantly more likely to be cigarette smokers and unmarried. No significant association was found between MAST scores of 5 or more and any of the alimentary symptoms with two exceptions. Constipation defined as straining at stool occurred significantly less often in problem drinkers and vomiting occurred significantly more often in problem drinkers (Table 79-80). The prevalence of alcohol abuse however was not significantly different in the functional and organic groups or in the upper and lower intestinal groups (Table 78). This study has confirmed the association of certain indicants viz male sex, single status, vomiting and the absence of constipation with the diagnosis of alcohol-associated functional dyspepsia - [144].

PSYCHONEUROTIC PROFILE (CCEI)

A. GP Study Group (Tables 33-35).

The Crown-Crisp Experiential Index (CCEI) revealed a significant difference in the mean scores between males and females with respect to free-floating anxiety, phobic anxiety, somatic anxiety and total CCEI (Table 33). No

significant difference between the sexes was noted with respect to obsessionality, depression or hysteria. Similar findings were reported when the validity of psychoneurotic profiles was first established - [157-158]. The psychiatric subgroup of the GP population scored significantly higher with respect to the subscales, free-floating anxiety, somatic anxiety, depression and total scores compared with the other groups as would be expected (Table 35). The alimentary group achieved subscale scores similar to those of the GP group as a whole with the exception of the somatic anxiety subscale (Table 35). This subscale however comprises feelings of dizziness and shortness of breath, nausea or indigestion, paraesthesia, loss of appetite, tiredness, sleeping difficulties, excessive sweating or palpitations and loss of sexual interest. The content of symptoms of an alimentary nature therefore diminishes the value of this specific subscale in patients with alimentary complaints. With this exception, no significant association was found between the CCEI subscales and the alimentary symptoms. Similarly there was no association between the CCEI subscales and the MAST scores in the GP group (Table 34). The female preponderance in the MAST non-scorers and the male preponderance in the problem drinkers however diminish the value of this analysis given the small numbers involved.

B. Hospital Clinic Group (Tables 87-99)

A comparison of the mean CCEI subscale scores in the hospital and GP groups showed no significant differences

with the exception of the obsessionality and somatic anxiety subscales (Table 87). Since the somatic anxiety subscale however relates specifically to certain alimentary symptoms, this difference is not surprising. As in the GP group, the CCEI subscale scores were not significantly different in the problem drinkers compared with MAST non scorers (Tables 34,88,91). The mean CCEI subscale scores were significantly greater in females compared with males in respect of free-floating anxiety, phobic anxiety and total CCEI score (Table 90); this finding is consistent with the findings of previous studies - [157, 158]. After correction for differences in the sex ratio using Bonferroni's test, a significant difference remained in the mean subscale scores in the functional group compared with the organic group with respect to free-floating anxiety and depression scores (Tables 89-92). Using regression analysis, the statistical significance of the difference between the two groups functional and organic was assessed after correction for age and sex (Table 93). Age was not found to be significantly associated with either the free-floating anxiety or total CCEI scores, only with depression scores (Table 93). The probability of a functional disorder was assessed in both the upper and lower alimentary groups using logistic regression analysis (Table 94). In this way, depression was shown to be significantly associated with functional upper gastro-intestinal disorders and free-floating anxiety with functional lower gastro-intestinal disorders. It is interesting to note that though the general

practitioner's referral letter included data of a psychiatric nature in 31% of the hospital clinic group, this occurred significantly more often only in the functional upper gastro-intestinal disorders and not the functional lower gastro-intestinal disorders (Tables 77,95).

The closest correlation with the total CCEI score was seen with the free-floating anxiety, phobic anxiety, somatic anxiety and depression subscale scores using a Spearman Rank correlation (Table 96). No significant correlation was found between the CCEI sub scale scores and the derived alimentary symptom cluster scores with the exception of urinary tract symptoms (Table 97). The urinary symptoms of urgency, frequency and nocturia were significantly associated with high free-floating anxiety, depression and total CCEI scores. Similarly the symptoms of anorexia, globus, acid reflux, weight loss, abdominal distension and abdominal pain were significantly associated with these specific CCEI subscale scores using Rank correlation coefficients (Table 98). The probability of a functional disorder was further assessed by linear logistic regression analysis (Table 99). In the upper gastro-intestinal group, the presence of a psychiatric comment in the referral letter, the absence of straining at stool and a high depression score all increased the probability of a functional disorder. In the lower alimentary group, the presence of abdominal pain and distension, a stool frequency of less than 3 times per day and a high free-

floating anxiety score all increased the probability of a functional lower alimentary disorder.

CURRENT MENTAL STATE IN THE HOSPITAL AND GP GROUPS (TABLES 30,76)

Using linear analogue ratings for anxiety and depression (0 - 5) the psychiatric subgroup of the GP group scored significantly greater on both scales compared to the alimentary and other groups. However within the hospital clinic group, the mean scores of the anxiety and depression ratings in the functional and organic groups were not dissimilar. Linear analogue rating scales for anxiety and depression have been well validated in psychiatric surveys comparing the frequency distribution of the severity of such symptoms - [219]. The methodology however is relatively crude and the information so obtained cannot be expected to accurately define the frequency or severity of anxiety and depression states.

Psychoneurotic profiles in functional alimentary disorders

The use of the Crown-Crisp Experiential Index in this study has provided a useful comparison on the frequency and severity of psychiatric symptoms in the different subgroups. Following correction for age and sex, significantly higher anxiety and depression scores were found in the functional lower and functional upper alimentary groups respectively compared with the organic groups (Tables 92-94). The method however does not

permit the identification of psychiatric caseness since it lacks a specific cut-off point. In quantifying the psychoneurotic profile there is a considerable overlap between psychiatric symptoms and personality traits. In testimony to this, the obsessionality and hysteria subscale scores correlated poorly with anxiety, depression and total CCEI scores.

Studies of the prevalence of psychiatric symptoms and psychiatric illness in patients with functional alimentary disorders have not previously identified differences in alimentary symptoms in patients with identifiable psychiatric problems. In one study of 96 patients, a psychiatric factor was considered to be the principal problem in 86%. Depression accounted for 37% of the psychiatric morbidity and anxiety for 26% - [23]. In another study of 41 patients with the irritable bowel syndrome compared with 25 matched subjects with psychoneurotic disorders and control subjects from the general population, the CCEI was used to assess the psychoneurotic profile in the different groups - [156]. The mean scores of the CCEI in the irritable bowel syndrome fell between the mean scores of control subjects and matched psychoneurotic patients and differed significantly from these two groups. The present study has shown similar findings; patients with functional disorders attending a hospital clinic had significantly higher mean CCEI subscale scores than patients attending their general practitioner after correction for age and sex. (Table 87). In a study of the level of anxiety and

neuroticism in patients with the irritable bowel syndrome compared with patients with ulcerative colitis and general medical patients, patients with functional diarrhoea without abdominal pain were significantly more anxious than the controls - [159]. Irritable bowel patients did not differ significantly from the control or colitis groups with respect to anxiety. As in the present study, the control group comprised patients with a general medical problem. Such control groups should eliminate bias resulting from the presence of psychological distress as a non-specific accompaniment of illness. The finding of no significant difference in the obsessionality subscale score between patients with functional and organic disorders is at variance with previous studies which have suggested that obsessional traits often accompany functional gastro-intestinal disorders - [21]. The latter study however used a personality inventory questionnaire to determine obsessionality unlike the present study. It is interesting that the obsessionality subscale score was however significantly greater in the hospital group compared with the GP group suggesting the possibility that only the more obsessional patients are referred for a second opinion. This possibility is supported by studies of the effects of psychological distress on physician utilisation which have shown that both psychoneurotic individuals and subjects with an irritable bowel are significantly more likely to seek medical advice than the general population at large - [38, 246].

STRUCTURED PSYCHIATRIC ASSESSMENT IN THE HOSPITAL GROUP

There is no reliable rapid screening test which will accurately establish the presence or absence of psychiatric illness and which does not require validation using a formal structured psychiatric interview. For this reason the Present State Examination was used as the basis for the psychiatric assessment of patients - [228,229]. The structure of the Present State Examination was modified so that the nature and severity of psychiatric symptoms experienced during the previous six months could be objectively assessed and expressed using universally accepted syndrome-based definitions of psychiatric illness - [229-233]. The structured interview was tape-recorded so that details of the time of onset and remission of psychiatric symptoms and the degree of psychiatric caseness could be later re-assessed independently. The index of definition criteria (IDC) and the research diagnostic criteria (RDC) were used to determine whether the patient was psychiatrically ill at the time of interview or at any time during the six months prior to interview. When psychiatric symptoms were present, the date of onset of the earliest psychiatric illness episode was recorded.

The possibility of biased selection of patients in the hospital clinic group was minimised by inviting alternate patients to co-operate in this aspect of the study. The fact that the interviews were conducted by personnel who were unaware of the clinical diagnosis lent further validity to the results obtained. In addition, since

only 10% of the patients invited to co-operate in the study declined to do so, the possibility of bias due to self-selection of patients was minimised. The exclusion of patients who could not be interviewed within three months of the date of the general practitioner's letter ensured an optimal recall of recent psychiatric symptoms. The 64 patients studied, 48% of the hospital clinic group, were comparable to the total clinic group with respect to age, sex and social class (Tables 3,4); 75% were found to have functional disorders of the GI tract (Table 100). The mean score of psychiatric symptoms experienced in the six months prior to interview was significantly greater in the functional group compared with the organic group (Table 102). Evidence of a current psychiatric illness using index of definition criteria was found in 33% of the study group all but one of whom had a functional disorder; using research diagnostic criteria, psychiatric illness was established in 28% of the study group, all but one of whom had a functional disorder (Tables 103-106). These differences between the two groups, functional and organic, were statistically significant. Psychiatric illness episodes prior to and during the study period were recorded in 54% of the functional group and 12.5% in the organic group a difference which was also statistically significant (Table 107). The majority of psychiatric illnesses comprised anxiety disorders with additional depressive disorders in many instances.

The prevalence of psychiatric illness in the general

population is higher in females than males - [157-158]. In view of the female preponderance in the study group, a control group of female subjects not seeking health care with no evidence of gastro-intestinal disease was therefore identified from the electoral register. These females had previously been the focus of extensive investigations and provided a group of 38 subjects to match 38 of the 39 females in the hospital clinic group with respect to age and social class - [232, 233]. No control subject could be found to match the 29 year old widow in the study group. Using research diagnostic criteria, current psychiatric illness was identified in 40% of the 30 females with functional disorders compared with 17% of the 30 controls (Table 138); previous or current psychiatric illness was found in 60% of females with functional disorders compared with 23% of controls (Table 139). No significant difference in the numbers of patients with psychiatric illness was found comparing 8 females with organic disorders and 8 controls; there was however a statistically significant difference between the females with functional disorders and controls (Tables 138,139.)

Although numerous studies on the psychological aspects of the irritable bowel syndrome have been published, many have serious methodological difficulties. In one study of 50 patients, no indication as to how patients were selected was given and the method of psychological assessment was not specified - [8]. The study concluded that 46% of patient had depression and 46% displayed

marked emotional instability. The reliability and validity of such conclusions in the absence of stated criteria for psychiatric illness is therefore impossible to judge. In another study only patients with the irritable bowel syndrome were reported when sufficient clilnical detail was available - [9]. No explanation was given as to how patients were studied "in a psychological manner"; 49% demonstrated exaggerated tension and a further 14% had anxiety and tension. Such vague diagnoses in the absence of any definitions or diagnostic criteria add little to an understanding of the irritable bowel. Hislop found that subjects with the irritable bowel syndrome had a significantly greater frequency of symptoms of depression than matched controls; 67% were considered to have a depressive disorder as adjudged by the response to anti-depressant therapy - [155]. The study concluded that the symptom complex of the irritable bowel is a concomitant of an affective disorder. In a more systematic study of psychiatric illness in the irritable bowel syndrome, 92% of 25 patients with the disorder were considered to have a psychiatric illness using specified criteria -[161]. Unfortunately there was no control group and as the authors comment, their patients may have been more severely ill than most or may have been unusual problems in management to account for the over-representation of patients with diagnosable psychiatric illness. In a study of 29 consecutive patients with the irritable bowel syndrome and 33 consecutive control medical patients, psychiatric illness was assessed using a structured psychiatric interview;

only 18% of controls had a psychiatric illness compared with 72% of irritable bowel subjects - [22]. The study group had a sex ratio male/female of 1/4; the psychiatric illnesses included depression, 45% and hysteria, 38%. No psychiatric illness was found in 27% of the irritable bowel patients studied. In a study of 96 patients with recurrent abdominal pain, only 16% had organic disorders responsible for their symptoms - [23]. In the remainder, psychiatric factors were considered to account for abdominal pain; depression was found in 32%, anxiety disorders in 22%, hysterical disorders in 18% and alcoholism in 12.5%. Similar findings have been found in patients with functional dyspepsia as well as patients with an irritable bowel - [21, 181, 248, 249]. In a psychiatric study of patients with gastro-intestinal disease of the small bowel, psychiatric illness was found in 34% of 80 patients using a structured psychiatric interview; the majority of the psychiatric illness episodes were minor affective disorders - [165].

This study has shown that in the absence of organic disease to account for gastro-intestinal symptoms, psychiatric illness is a common occurrence. Nonetheless the majority of patients presenting with functional disorders to a gastro-intestinal clinic do not have overt psychiatric illness at time of presentation indicating the error in assuming that a patient's physical symptoms usually arise from a psychological disturbance if an organic basis cannot be established - [16]. However when the prevalence of psychiatric disorders is determined

using specific criteria with cut-off scores, it is possible to under-estimate psychiatric factors. For example, using the psychiatric assessment scores, only 10% of patients with functional disorders had no psychiatric symptoms compared with 38% of patients with an organic disorder (Table 103). It is possible therefore that psychiatric factors were a significant feature of the majority of patients with a functional disorder but that using I.D. and R.D. criteria of caseness, this can only be proven to be a major factor in half (Table 107). In support of this possibility is the finding that the index of definition caseness levels closely correlated with the CCEI subscale scores for free-floating anxiety, phobic anxiety, depression and total CCEI (Table 108). When these subscale scores were compared in patients with and without psychiatric illness as defined by the index of definition and research diagnostic criteria, there was a highly statistically significant difference found (Tables 109-111). A similar correlation was also found between the IDC and RDC caseness, functional diagnosis and anxiety and depression linear analogue ratings (Tables 112-113).

As was seen in the hospital group as a whole, the MAST alcoholism scores did not correlate either with I.D. or R.D. psychiatric caseness or with functional diagnoses (Tables 114-116).

LIFE SITUATIONS INVENTORY IN THE HOSPITAL GROUP

Many studies have identified life experiences using a simple inventory of commonly encountered life situations. Such methodology however has been criticised since life events were assessed retrospectively and simple inventories fail to identify the personal implications of life events for the individuals experiencing them. In addition, the methodology makes it difficult to exclude the possibility that psychiatric illness occurring in association with a life situation may have influenced not only the situation itself but also the recall and the reporting of the event - 185, 236. The methodology of the Bedford College Life Event and Difficulty Schedule has made it possible to rate of the contextual threat of an event by assessing the impact of an event on the person experiencing it - 185. The method takes into account the context in which the event occurs and distinguishes between a single experience (an event) and a more chronic situation (a long-term difficulty). This study has used a modification of the Bedford College methodology to assess and categorise life situations with respect to six dimensions of experience - 237-238. The interviews were conducted by experienced personnel unaware of the diagnosis; the events and difficulties recorded were then rated independently both by the interviewer and by another person who then met and resolved any disagreements. The inventory of life situations concerned itself primarily with situations arising within

the six months prior to interview. In addition a record was also made of previous life situations when these occurred in the context of a pre-existing psychiatric disorder. In this way, given a maximum delay of three months between the date of hospital referral and the interview, both the psychiatric assessment and the life situation inventory spanned at least three months prior to hospital referral.

Nonetheless the assessment of life situations was subject to possible sources of error. The data collected was entirely retrospective and the recall of situations may therefore have been influenced by the effect of illness occurring after a situation had arisen. The recall of a situation may also have been influenced by the emotional state of the subject. In addition the experience of a situation as stressful may result from other factors which might also influence bowel symptoms independently. For example, psychiatric illness might have led both to the development of an irritable bowel and to a greater tendency to experience life situations as stressful - [175]. The stressfulness of life situations is closely associated with and dependent upon the psychological state of the subject experiencing the situation. This source of potential error was however minimised by omitting situations considered to have arisen as a result of psychiatric illness. There is no doubt that whilst the recall of events and difficulties in the recent past is accurate in most instances, this is not the case for situations arising in the distant past. In addition the

more crucial and stressful life situations are those most likely not to be accurately recalled - [239-240]. For these reasons, the combination of a psychiatric assessment and life situation inventory spanning no more than the previous six months was employed. The limitations of this methodology were unlikely to have introduced bias in the comparison of the functional and organic groups since if anything imperfect recall would under-estimate possible differences between the groups.

This study has shown that over the six months preceding interview, only 11% of the 64 patients studied experienced neither an event nor a difficulty of an unpleasant nature (Table 117). Pleasant events were experienced by 45% of the study group; patients in the organic group experienced pleasant events significantly more often that patients in the functional group (Table 118). This finding might well be explained by the fact that the recall of pleasant events in patients who are psychiatrically disturbed is likely to be impaired. Adverse events or difficulties were experienced by 89% of the 64 patients, a proportion which was identical in the two groups; similarly adverse events alone were experienced by 39% of patients in both groups (Tables 119-125). The existence of a close confidant was noted in 58% of the study group a proportion not significantly different in the functional and organic groups (Tables 126-128). Major stressful life situations were assessed on the basis of previous studies which have shown that certain characteristics or dimensions of experiences are

more likely to provoke significant emotional responses - 187, 238. Using two different scoring methods to weight major stress, anxiety-provoking situations were experienced by 30-39% of the study group, a proportion not significantly different in the functional and organic groups (Tables 129, 130, 134). Though the mean score of the major stresses experienced was greater in the functional group compared with the organic, the difference was not statistically significant (Table 129). Neither current psychiatric illness nor an anxiety-provoking situation was present in 46% of the functional group compared with 69% of the organic group, a difference which was not statistically significant (Table 134).

An attempt was made to assess a possible causal relationship between psychiatric illness, anxiety provoking life situations and the onset of functional bowel disorders (Tables 130-136). Some of the patients had suffered bowel symptoms for several years whereas the psychiatric and life situation data was based principally on the six months prior to interview. Nonetheless many of the psychiatric illness episodes and life situations had also lasted several years and were often present before the onset of bowel symptoms. Inevitably some psychiatric illness episodes and life situations will have been overlooked if they occurred before the six month period commenced. This possibility however should not introduce bias in the comparison of the functional and organic groups and would if anything under-estimate

possible differences. With these limitations, 31% of the 48 patients with functional disorders had suffered psychiatric illness prior to the onset of bowel symptoms but none of the 16 patients with organic disorders appeared to have done so; the difference was statistically significant (Tables 135,136). No significant difference was found between the groups with respect to the presence or absence of an anxiety provoking situation. However when the presence of either a psychiatric illness or an anxiety provoking situation before the onset of bowel symptoms was considered, there was a highly significant difference between the groups (Tables 135,136). When a comparison of females with a functional disorder was made with healthy matched controls (identified from the electoral register), a significantly increased prevalence of psychiatric illness (RD criteria) was found in the functional group; 40% of the functional group and 17% of the control group had a current psychiatric illness (Tables 138,139). With one exception no patient had an isolated depressive illness without an additional anxiety state (Table 138). No significant differences between the functional and control groups was observed with respect to the presence of an anxiety provoking situation occurring in the six months prior to interview (Tables 143-148).

This study has shown that in many instances the onset of functional gastro-intestinal disorders results specifically from an anxiety disorder or an anxiety

provoking situation. Life situations alone however did not appear to cause a functional disorder unless they gave rise to an anxiety state. Psychiatric illness preceded the onset of bowel symptoms in one-third of patients with functional disorders compared with none of the 16 with organic disease. Psychiatric illness and/or an anxiety provoking situation preceded the onset of bowel symptoms in two-thirds with functional disorders compared with none of the 16 with organic disease. There remains a third of patients in the functional group in whom there is neither a stressful life situation nor overt evidence of psychiatric illness. Though a different causal mechanism may be in operation, dietary factors such as fibre deficiency may be relatively more important in this group. The possibility that previous undisclosed psychosocial and behavioural factors may still be important however cannot be excluded.

Previous studies of life events in functional bowel disorders have frequently been bedeveilled by methodological difficulties. The fact that the bowel participates in biological reactions to stressful life situations has been well demonstrated by experimental studies in the irritable bowel and by observations on colonic fistulas during periods of emotional distress - [10,102]. In a study of 130 patients with the irritable bowel, a psychological factor was found in 86% of females and 65% of males - [12]. Anxiety attributable to stressful life situations accounted for 51% of the psychological factors identified in the 79% of patients

in whom a psychological factor was predominant - [12]. An acute stressful life situation had occurred in 50% of 67 patients prior to the onset of symptoms in the irritable bowel syndrome and included bereavement, marital separation and domestic discord - [155]. No indication as to the methodology of identifying stress factors was given however and there appeared to be no significant difference between the irritable bowel group and control subjects.

Using structured interviews and a simple life event inventory (Holmes - Rahe) spanning six months prior to interview, 102 patients with an irritable bowel, 158 patients with ulcerative colitis and 735 healthy controls were studied - [180]. A past history of major illness and stressful life situations was significantly more frequent in the irritable bowel group; patients with ulcerative colitis did not differ significantly from the general population in this regard. Using a life event inventory (Holmes-Rahe) and a psychiatric interview in 96 patients with recurrent abdominal pain, 84% were considered to have a predominantly psychological cause for their pain - [23]. There was no significant difference in the total life event scores between the functional and organic groups. Similar studies of life events using a modification of the Holmes and Rahe social re-adjustment rating method also showed no difference between patients with the irritable bowel and patients with ulcerative colitis - [178]. No significant correlation between major life situations and the presence or absence of an organic

cause for gastro-intestinal symptoms was found in a study of 100 consecutive medical referrals - [21]. However when stressful life events were assessed during a one year follow-up study of 99 patients with the irritable bowel syndrome, 76% of the 50 patients who reported life events during follow-up experienced an exacerbation of their bowel symptoms during the stressful event - [169].

Two major studies of life events, psychiatric illness and alimentary disease have been undertaken employing the Bedford College Life Situation Assessment with contextual rating of events and difficulties - [20, 184]. In one of the studies, life situations were recorded over the 12 months prior to appendicectomy in 119 patients - [184]. In approximately 50% of patients the appendicitis was confirmed histologically and in the remainder, the appendix was not acutely inflamed. Severe threatening life events over the preceding 38 weeks were experienced by 59% of patients whose appendix was not inflamed compared with 25% whose appendix was acutely inflamed; this difference was statistically significant. One year later, 41% of patients continued to experience abdominal pain of whom a quarter also experienced bowel symptoms; 70% of these patients had had a normal appendix removed - [184]. Using the Present State Examination and index of definition criteria, psychiatric caseness was established in 32% of patients in whom a normal appendix was removed compared with 16% of patients whose appendix was acutely inflamed; two-thirds of the psychiatric morbidity was

attributable to anxiety disorders and a third, depression. Though it is likely that patients in whom a normal appendix is removed were suffering from an irritable bowel, it is uncertain whether the stress associated with this group was related to the development of abdominal pain or the act of seeking medical advice or both. Whereas all patients with definite acute appendicitis require treatment, this is clearly not the case in patients with non-inflamed appendices who select themselves by requesting medical consultation. Stressful life events are known to increase the likelihood of medical consultation - [40, 186]. Since 50% of patients who had had a normal appendix removed continued to experience abdominal pain, the findings of this study are of immediate relevance; 30-50% of irritable bowel patients have previously had an appendicectomy -[63, 69, 74]. Using the same Bedford College methology, stressful life events and difficulties have been studied in 135 consecutive referrals to gastrointestinal clinics - [20]. Severely threatening events and major difficulties in the 38 weeks before the onset of abdominal pain were experienced by 57% of the 79 patients (59%) with a functional disorder, 23% of the 56 patients (41%) with organic disease and 15% of a community comparison group, a difference which was statistically significant. The majority of severe events in the functional group involved loss and disappointment and were comparable to those events known to produce depression - [187]. However, no psychiatric data were reported and the prevalence of psychiatric illness in the

study groups was unrecorded.

FUNCTIONAL DISORDERS OF THE ALIMENTARY TRACT

SUMMARY

No evidence of organic disease was found in 72% of patients aged between 18 and 60 years referred by their general practitioner to a gastro-intestinal clinic when assessed independently 12 weeks after the initial clinic consultation. Of the 97 patients with functional gastro-intestinal disorders, 77% had symptoms primarily referrable to the lower gastro-intestinal tract (the irritable bowel syndrome) and 23% had symptoms primary referrable to the upper intestinal tract (functional dyspepsia). It could be argued that prolonged follow-up is necessary before organic disease can be safely excluded. Previous studies have shown however that when a diagnosis of a functional bowel disorder is made after appropriate investigations, the subsequent discovery of an organic cause for symptoms will emerge in fewer than 5% - [70, 167, 199].

No-one doubts that a careful history and examination are vital in establishing a positive diagnosis of a functional bowel disorder - [56-57]. However the symptoms which characterise functional disorders are common among subjects not seeking health care and are indistinguishable from those occurring in organic disease of the bowel - [36,37,65,66]. The occurrence of frequent episodes of abdominal distension, a change in the severity of abdominal pain after defaecation and a change in the frequency or consistency of bowel motions at times of abdominal pain all occur significantly more frequently in patients with functional disorders; similar findings

have been confirmed by others - [56, 245, 246]. Useful as these symptoms are in characterising groups of patients with bowel disorders, such clusters of symptoms do not safely exclude the possibility of organic disease in the individual subject - [245].

Psychoneurotic profiles have confirmed that both anxiety and depression ratings are significantly higher in patients with functional disorders compared with organic disorders. Depression ratings particularly are associated with functional dyspepsia and anxiety ratings with the irritable bowel syndrome. These significant differences between the groups were confirmed by a structured psychiatric assessment. A current psychiatric illness was identified in 33% of 64 patients studied all but one of whom had a functional disorder. Serious alcohol misuse was identified in 15% of patients, a proportion not significantly different in the functional and organic groups.

Severe stressful life situations likely to provoke anxiety states were found in 30% of the study group a proportion not significantly different in the functional and organic groups. Previous studies of life events in irritable bowel patients and control subjects, using a modification of the method of Holmes and Rahe, have failed to show any significant difference. - [23, 155, 178, 180]. Using a similar method however, stressful life events were reported by 50% of irritable bowel patients during a 12 month period of follow-up of whom three-

quarters experienced an exacerbation of their symptoms at the time of the stressful life situation - [168,169].

Studies of life events in the year preceding the onset of abdominal pain in gastrointestinal clinic referrals have established a significant excess of severely threatening situations in patients with functional bowel disorders using the Bedford College methodology - [20]. This study has shown that in many instances the onset of functional bowel disorders results specifically from an anxiety disorder or an anxiety provoking situation. Life situations alone however did not appear to cause a functional disorder unless they gave rise to an anxiety state. Psychiatric illness preceded the onset of bowel symptoms in one-third of patients with functional bowel disorders compared with none of the patients with organic disease. Psychiatric illness and/or an anxiety provoking situation preceded the onset of bowel symptoms in two-thirds of patients with functional disorders compared with none of the patients with organic disease. There remains a third of patients in the functional group in whom there is neither a stressful life situation nor overt evidence of psychiatric illness.

The results of this study could be consistent with the hypothesis that the irritable bowel syndrome is a psycho-physiological disorder. If such symptoms are the result of physiological changes associated with emotional distress, one would anticipate that the physiological responses would be more intense in irritable bowel

patients compared with psychoneurotic patients without alimentary symptoms - [172-173]. This has never been substantiated however in studies demonstrating pain thresholds in response to colonic distension in irritable bowel patients compared with normal controls and psychoneurotic individuals without bowel symptoms - [82]. Perhaps the more appropriate model for functional disorders is that provided by the model of a behavioural disorder. There is a social dimension to any illness experience which determines how patients perceive, interpret and react to bodily changes - [18]. Social factors may account at the one extreme for the denial of illness and at the other, for requests for consultation disproportionate to the severity of the illness. The finding that subjects with bowel dysfunction frequently report non-gastro-intestinal symptoms and are more likely to request medical consultation for such symptoms is relevant - [246]. These observations and the increased prevalence of psychiatric symptoms in irritable bowel patients all support the hypothesis that the irritable bowel syndrome may be due to behavioural influences which lead to requests for medical consultation.

The behavioural disorder of the irritable bowel syndrome probably reflects physiological responses acquired in childhood during stressful life situations. Previous illness experience and observed and unlearned illness behaviour in childhood may be the controlling factors in the choice of symptoms - [173]. In support of this in the finding that 67% of parents and 50% of siblings of

children with recurrent abdominal pain have themselves suffered from chronic abdominal pain - [203, 204]. One-third of adults with the irritable bowel syndrome had experienced similar symptoms during childhood - [63]. One half of children with recurrent abdominal pain continue to experience abdominal symptoms in adult life - [201, 202].

Inappropriate concentration of medical attention of somatic detail to the exclusion of psychological and social aspects may adversely affect the outcome in the irritable bowel patient - [29]. Nonetheless despite a careful history and examination a firm clinical diagnosis cannot be achieved without the necessary investigations to exclude organic disease. For each patient the influence of the three major contributory elements viz. somatic factors, psychiatric factors and life situations should be assessed in the evolution and maintenance of functional bowel symptoms. The complex inter-relationship between psychiatric illness, stressful life situations and somatic complaints may be viewed as a catalytic process precipitating both the symptomatic state and the request for medical consultation. This process is perhaps best conceptualised using the geometric approach provided by catastrophe theory - [210-212]. Given the sudden transition experienced by subjects who develop the irritable bowel syndrome, the principal determinants are likely to be the level of neuroticism, the severity of somatic factors and the degree of contextual threat of life situations.

Catastrophe theory could help explain the sudden discontinuous change from wellbeing to the symptomatic state so often experienced by irritable bowel patients.

Such a background to functional disorders probably accounts for the difficulties experienced in the treatment of these conditions - [249]. Not only does an anxiety disorder render the irritable bowel more refractory to conventional therapy, it also engenders anxiety in the clinician and may compromise the doctor-patient relationship by stimulating continued and often unwarranted investigations which increase the patient's anxiety still further. Following a careful history, examination and investigation, the cornerstone of management remains that of a sympathetic discussion of all these factors together with firm reassurance. Such an approach should assist patients in acquiring a different perspective of their symptoms; a better understanding of this enigmatic condition should be achieved when to soma and psyche is added circumstance - 188, 250.

BIBLIOGRAPHY

1. Fielding, J.F.

"The irritable bowel syndrome
An historical view"

J. Irish Coll. Phys. Surg., (1977), 6, 133-138

2. Powell, R.

"On certain afflictions of the intestinal canal."

Med. Transact. Roy. Coll. Phys.

(1820), 6, 106-117.

3. Da Costa, J.M.

"Membranous enteritis"

Amer. J. Med. Sci. (1871), 62, 321-338.

4. Hale White,W.

"A study of 60 cases of
membranous colitis".

Lancet., (1905), 2, 1229-1235.

5. Allbutt, T.C.

"The Gulstonian lectures on
Neuroses of the viscera"

Brit. Med.J., (1884),1, 543-547

6. Hawkins, H.P.

"The reality of enterospasm and
its mimicry of appendicitis"

Brit. Med. J., (1906), 1, 65-69.

7. Ryle, J.A.

"Chronic spasmodic affections of the
colon and the diseases which they simulate"

Lancet, (1928), 2, 1115-1119

8. Bockus, H.L., Bank, J. + Wilkinson, S.A.

"Neurogenic mucous colitis"

Amer. J. Med. Sci. (1928), 176, 813-829.

9. White, B.V. + Jones, C.M.

"Mucous colitis : a delineation of the syndrome with certain observations on its mechanism and on the role of emotional tension as a precipitating factor.

Ann. Int. Med., (1940), 14, 854-872.

10. Almy, T.P.

"Experimental studies on the Irritable Colon"

Amer. J. Med. (1951), 10, 60-67.

11. Peters, G.A. + Bargen, J.A.

"The irritable bowel syndrome"

Gastroenterol., (1944), 3, 399-402

12. Chaudhary,N.A. + Truelove,S.C.

"The Irritable colon syndrome. A study of the clinical features, predisposing causes and prognosis in 130 cases".

Quart. J. Med. (1962), 31, 307-322.

13. Cabot, R.C.

"Suggestions for re-organisation of hospital outpatient departments with special reference to improvement of treatment".

Md. State. Med.J., (1907), 50, 81-91.

14. Stoeckle, J.D., Zola, I.K. + Davidson. G.E.

"The quantity and significance of psychological distress in medical patients. Some preliminary observations about the decision to seek medical aid".

J. Chronic dis. (1964), 17, 959-970.

15. Trimble, M.

"Functional disease"

Brit. Med. J. (1982), 285, 1768-1750

16. Bridges, K.W. + Goldberg, D.R.

"Psychiatric illness in in-patients with neurological disorders: patients' views on discussion of emotional problems with neurologists.

Brit. Med. J. (1984), 289, 656-658

17. Barsky, A.J.

"Patients who amplify bodily symptoms"

Ann. Intern. Med., (1979), 91, 63-70

18. Mechanic, D.

"Social psychologic factors affecting the presentation of bodily complaints"

New Engl. J. Med., (1972), 286, 1132-1139

19. Lloyd, G.

"Medicine without signs"

Brit. Med. J., (1983), 287, 539-542.

20. Craig, T.K.J. + Brown, G.W.

"Goal frustration and life events in the aetiology of painful gastrointestinal disorder".

J. Psychosom. Res. (1984), 28, 411-421.

21. Macdonald, A.J. + Bouchier, I.A.D.

"Non-organic gastrointestinal illness : A medical and psychiatric study".

Brit. J. Psychiat., (1980), 136, 276-283.

22. Young, S.J., Alpers, D.H., Norland, C.C., + Woodruff, R.A.

"Psychiatric illness and the irritable bowel syndrome. Practical implications for the primary physician".

Gastroenterol., (1976), 70, 162-166

23. Gomez, J. + Dally, P.

"Psychologically mediated abdominal pain in surgical and medical out-patient clinics".

Brit. Med. J., (1977), 1, 1451-1453.

24. Shepherd. M., Davies, B., + Culpan, R.H.

"Psychiatric illness in the general hospital".

Acta Psychiat. Neurol. Scand. (1960), 25, 518-525.

25. Kirk, C.A., + Saunders, M.

"Psychiatric illness in a neurological out patient department in north-east England; use of the general health questionnaire in the prospective study of neurological out-patients."

Acta. Psychiat. Scand. (1979), 60, 427-437.

26. Bond, M.R.

"Psychological and psychiatric aspects of pain".

Anaesthesia (1978), 33, 355-361

27. Stengel, E.

"Pain and the psychiatrist"

Brit. J. Psychiat. (1965) 111, 795-802.

28. Mayou, R.

"The nature of bodily symptoms"

Brit. J. Psychiat., (1976), 129, 55-60.

29. Kreitman, N., Sainsbury, R., Pearce, K. + Costain, W.R.

"Hypochondiasis and depression in out-patients in a general hospital"

Brit. J. Psychiat., (1965), 111, 607-615.

30. Kendell, R.E.

"Hysteria"

In "The neuroses and personality disorders"

Handbook of Psychiatry Vol. 4
Ed. Russell, G.F.M. + Hersov, L.A.
Cambridge. Cambridge Univ. Press
(1983), 232-246.

31. Leading article

"Unruly guts"

Lancet, (1972),2, 960-961.

32. Almy, T.P., Mendeloff, A.I., Rice, D. Lilienfield, A., Klarman. H., Rawson, P. + Cunnick, W.R.

"Prevalence and significance of digestive disease".

Gastroenterol., (1975), 68, 1351-1371.

33. Switz, D.M.

"What the gastroenterologist does all day. A survey of a state society's practice.

Gastroenterol., (1976), 70, 1048-1050.

34. Ferguson, A., Sircus, W. + Eastwood, M.A..

"Frequency of "functional" gastrointestinal disorders".

Lancet, (1977), 2, 613-614.

35. Harvey, R.F., Salih, S.Y. + Read, A.E.

"Organic and functional disorders in 2000 gastroenterology out-patients"

Lancet, (1983), 1, 632-634.

36. Thompson, W.G. + Heaton, K.W.

"Functional bowel disorders in apparently health people"

Gastroenterol., (1980), 79, 283-288.

37. Drossman, D.A., Sandler. R.S., McKee, D.C. + Lovitz. A.J.

"Bowel patterns among subjects not seeking health care"

Gastroenterol., (1982), 83, 529-524.

38. Tessler, R., Mechanic, D. + Diamond, M.

"The effect of psychological distress on physician utilisation : a prospective study".

J. Health. Soc. Behav., (1976), 17, 353-364.

39. Office of Population Censuses and Surveys

"General Household Survey"

London. HMSO. (1977).

40. Ingham,J.G. + Miller,P.McC.

"Symptom prevalence and severity in a general practice population"

J.Epidem. Commun.Health (1979), 33, 191-198.

41. Ingham, J. + Miller, P. McC.

"Consulting with mild symptoms in general practice"

Soc. Psychiat., (1982), 17, 77-88.

42. Ingham, J. + Miller, P. McC.

"Self-referral : social and demographic determinants of consulting behaviour"

J. Psychom. Res., (1983), 27,233-242.

43. Krag, E.

"Non-ulcer dyspepsia. Introduction :

Epidemiological data"

Scand. J. Gastroenterol. (1982), 17, suppl. 79, 6-8.

44. Watkinson, G.

"The incidence of chronic peptic ulcer found at necropsy"

Gut,(1960), 1, 14-30.

45. Mollman, K.M., Bonnevie, O. Gudbrand-Hoyer, E. + Wulff, H.R

"A diagnostic study of patients with upper abdominal pain".

Scand. J.Gastroenterol. (1975), 10, 805-809.

46. Thompson, W.G.

"Functional dyspepsia" In "The irritable gut"

Baltimore. Univ. Park Press., (1979), 153-172.

47. Cotton, P.B.

"Fibreoptic endoscopy and the barium meal - results and implications".

Brit. M

"Fibreoptic endoscopy and the barium meal - results and implications".

Brit. Med. J., (1973), 2, 161-165.

48. Gear, M.W.L. + Barnes, R.J.

"Endoscopic studies of dyspepsia in a general practice".

Brit. Med. J., (1980), 280, 1136-1137

49. Thompson, W.G. + Heaton K.W.

"Heartburn and globus in apparently healthy people"

Can. Med. Ass. J., (1982), 126, 46-48

50. Gibson, M.A.R., Varghese, A., Clarke, K.E., Irwin, W.G. + Love, A.G.H.

"Heartburn for the patient - heartache for the doctor"

Brit. Med. J., (1983), 287, 465-466.

51. Horrocks, J.C. + De Dombal, F.T.

"Diagnosis of dyspepsia from data collected by a physician's assistant".

Brit. Med. J., (1975), 3, 421-423.

52. Edwards, F.C. + Coghill, N.F.

"Clinical manifestations in patients with chronic atrophic gastritis, gastric ulcer and duodenal ulcer".

Quart. J. Med. (1968), 37, 337-360.

53. Fielding, J.F. + Doyle, G.D.

"The prevalence and significance of gastritis in patients with lower intestinal irritable bowel (irritable colon) syndrome".

J. Clin. Gastroenterol. (1982), 4, 507-510.

54. Gregg, J.A. + Garabedian, M.

"Duodenitis".

Amer. J. Gastroenterol., (1974), 61, 177-184.

55. Horrocks, J.C. + De Dombal, F.T.

"Clinical presentation of patients with dyspepsia : detailed symptomatic study of 360 patients".

Gut (1978), 19, 19-26

56. Manning,A.P., Thompson,W.G., Heaton,K.W. + Morris,A.F.

"Towards positive diagnosis of the irritable bowel".

Brit. Med. J. (1978), 2, 653-654.

57. Fielding, J.F.

"Detailed history and examination assist positive clinical diagnosis of the irritable bowel syndrome".

J. Clin. Gastroenterol. (1983), 5, 495-497.

58. Thompson, W.G.

"Gastrointestinal symptoms in the irritable bowel compared with peptic ulcer and inflammatory bowel disease"

Gut, (1984), 25, 1089-1092

59. Dotevall,G., Svedlund,J. + Sjodin,I.

"Symptoms in irritable bowel syndrome"

Scand. J. Gastroenterol. (1982) 17, Suppl. 79., 16-19

60. Thompson, W.G.

"Functional diarrhoea". In "The irritable gut".

Baltimore. Univ. Park Press, (1979), 85-92.

61. Bolin, T.D., Davis, A.E. + Duncombe, V.M.

"A prospective study of persistent diarrhoea".

Aust. N.Z. J. Med., (1982) 12, 22-26.

62. Read, N.W., Krejs, G.J., Read, M.G., Santa Ana, C.A. Morawski, S.G. + Fordtran, J.S.

"Chronic diarrhoea of unknown origin".

Gastroenterol., (1980), 78, 264-271.

63. Fielding,J.F.

"A year in out-patients with the irritable bowel syndrome".

Irish J. Med. Sci (1977), 146, 162-166

64. Goulston, K.

"Clinical diagnosis of the irritable colon syndrome".

Med. J. Aust. (1972), 1, 1122-1125.

65. Isgar, B., Harman, M., Kaye, M.D. + Whorwell, P.J.

"Symptoms of irritable bowel syndrome in ulcerative colitis in remission".

Gut., (1983), 24, 190-192.

66. Thompson, W.G., Patel, D.G., Tao, H. + Nair, R.C.

"Does uncomplicated diverticular disease produce symptoms?".

Digest. Dis. Sci., (1982),27, 605-608.

67. Connell, A.M.

"The motility of the pelvic colon. II. Paradoxical motility in diarrhoea and constipation".

Gut, (1962), 3, 342-348.

68. McNeil, N.I. + Rampton, D.S.

"Is the rectum usually empty? - A quantitative study in subjects with and without diarrhoea".

Dis. Colon. Rectum. (1981), 24, 596-599.

69. Fielding, J.F.

"The irritable bowel syndrome.
I. Clinical spectrum".

Clinics in Gastroenterol., (1977), 6, 607-622.

70. Hawkins, C.F. + Cockell, R.

"The prognosis and risk of missing malignant disease in patients with unexplained and functional diarrhoea".

Gut (1971), 12, 208-211.

71. Watson,W.C., Sullivan,S.N., Corke,M. + Rush,D.

"Globus and headache : common symptoms of the irritable bowel syndrome".

Can. Med. Ass. J. (1978), 118, 387-388.

72. Kirsner, J.B. + Palmer, W.L.

"The irritable colon".

Gastroenterol., (1958), 34, 491-501.

73. Fielding, J.F.

"The diagnostic sensitivity of physical signs in the irritable bowel syndrome".

Irish Med. J, (1981), 74, 143-144.

74. Fielding, J.F., Bianchi, P., Brown, J.M. Nicolopo, N. + Softley, A.

"The OMGE irritable bowel survey".

Scand. J. Gastr., (1984) 19, Suppl. 95, 70-72.

75. Lane, D.

"The irritable colon and right iliac fossa pain".

Med. J. Aust. (1973), 1, 66-67.

76. Ingram, P.W. + Evans, G.

"Right iliac fossa pain in young women".

Brit. Med. J., (1965), 2, 149-151.

77. Ray, B.S. + Neill. C.L.

"Abdominal visceral sensation in man".

Ann. Surg., (1947), 126, 709-724.

78. Swarbrick, E.T., Hegarty, J.E., Bat, L., Williams, C.B., + Dawson, A.M.

"Site of pain from the irritable bowel".

Lancet, (1980), 2, 443-446.

79. Moriarty, K.J. + Dawson, A.M.

"Functional abdominal pain : further evidence that whole gut is affected".

Brit. Med. J. (1982), 284, 1670-1672.

80. Holdstock, D.J., Misiewicz, J.J. + Waller, S.L.

"Observations on the mechanism of abdominal pain".

Gut, (1969), 10, 19-31.

81. Ritchie, J.

"The irritable bowel syndrome. II. Manometric and cineradiographic studies".

Clinics in Gastroenterol. (1977), 6, 622-631.

82. Latimer. P., Campbell, D., Latimer, M. Sarna, S., Daniel, E. + Waterfall, W.

"Irritable bowel syndrome : a test of the colonic hyperalgesia hypothesis".

J. Behav. Med. (1979), 2, 285-295.

83. Whitehead, W.E., Engel, B.T. + Schuster, M.M.

"Irritable bowel syndrome. Physiological and psychological differences between diarrhoea - predominant and constipation - predominant patients".

Digest. Dis. Sci., (1980), 25, 404-413.

84. Cormack, R.M.

"A review of classification".

J. Roy. Statist. Soc. (1971), 134, 321-367.

85. Card, W.I., Lucas, R.W. + Spiegelhalter, D.J.

"The logical description of a disease class as a Boolean function with special reference to the irritable bowel syndrome".

Clin. Sci. (1984), 66, 307-315.

86. Hywel Jones, J., Lennard-Jones, J.E. Morson, B.C., Chapman, M., Sackin, M.J., Sneath, P.H.A.,Spicer, C.C. + Card, W.I.

"Numerical taxonomy and discriminant analysis applied to non-specific colitis.

Quart. J. Med., (1973), 42, 715-732

87. Whorwell, P.J., Clouter. C. + Smith, C.L.

"Oesophageal motility in the irritable bowel syndrome".

Brit. Med. J., (1981), 282, 1101-1102.

88. Horowitz, L. + Farrar, J.T.

"Intraluminal small intestinal pressures in normal patients and in patients with functional gastrointestinal complaints".

Gastroenterol., (1962), 42, 455-464.

89. Thompson, D.G., Laidlaw, J.M. + Wingate, D.L.

"Abnormal small-bowel motility demonstrated by radiotelemetry in a patient with irritable colon.

Lancet. (1979), 2, 1321-1323.

90. Corbett, C.L., Thomas. S., Read, N.W. Hobson, N., Bergman, I. + Holdsworth, C.D.

"Electrochemical detector for breath hydrogen determination : measurement of small bowel transit time in normal subjects and patients with irritable bowel syndrome".

Gut, (1981), 22, 836-840.

91. Cann, P.A., Read, N.W., Brown, C. Hobson, N. + Holdsworth, C.D.

"Irritable bowel syndrome: relationship of disorders in the transit of a single solid meal to symptom patterns".

Gut., (1983), 24, 405-411.

92. Burns, T.W.

"Colonic motility in the irritable bowel syndrome".

Arch. Intern. Med., (1980), 140, 247-251.

93. Snape, W.J., Carlson, G.M., Matarazzo, S.A. + Cohen, S.

"Evidence that abnormal myoelectrical activity produces colonic motor dysfunction in the irritable bowel syndrome".

Gastroenterol. (1977), 72, 383-387.

94. Taylor, I., Darby, C. + Hammond, P.

"Comparison of rectosigmoid myoelectrical activity in the irritable colon syndrome during relapses and remissions".

Gut, (1978), 19, 923-929.

95. Drossman, D.A., Powell, D.W. + Sessions, J.T.

"The irritable bowel syndrome".

Gastroenterology, (1977), 73, 811-822.

96. Latimer, P., Sarna, S., Campbell, D., Latimer, M., Waterfall, W. + Daniel, E.E.

"Colonic motor and myoelectrical activity : a comparative study of normal subjects, psychoneurotic patients and patients with irritable bowel syndrome".

Gastroenterology, (1981), 80, 893-901.

97. Wolf, S.G. + Almy, T.P.

"Experimental observations on cardiospasm in man".

Gastroenterology, (1949), 13, 401-421.

98. Bennett, T.I. + Venables, J.F.

"The effects of the emotions on gastric secretion and motility in the human being".

Brit. Med. J., (1920), 2, 662-663.

99. Wingate, D.L., McRae, S., Younger, K. + Thompson, D.G.

"Stress and jejunal motor activity".

Gut, (1982), 23, 404-409.

100. Cann, P.A., Read, N.W., Cammack, J., Childs, H., Holden, S., Kashman. R., Longmore, J., Nix, S., Simms, N., Swallow, K. + Weller, J.

"Psychological stress and the passage of a standard meal through the stomach and small intestine in man".

Gut, (1983), 24, 236-240.

101. Chaudhury, N.A. + Truelove, S.C.

"Human colonic motility : effect of emotions".

Gastroenterology, (1961), 40, 27-36.

102. Grace, W.J., Wolf, S. + Wolff, H.G.

"Life situations, emotions and colonic function".

Gastroenterol, (1949), 14, 93-108.

103. Harvey, R.F.

"The irritable bowel syndrome. III. Hormonal influences".

Clinics in Gastroenterology, (1977), 6, 631-641.

104. Harvey, R.F. + Read, A.E.

"Effect of cholecystokinin on colonic motility and symptoms in patients with the irritable bowel syndrome".

Lancet., (1973), 1, 1-3.

105. Besterman, H.S., Sarson, D.L.,Ramband, J.C.,Stewart,J.S. Guerin, S. + Bloom, S.R.

"Gut hormone response in the irritable bowel syndrome"

Digestion, (1981), 21, 219-224.

106. Preston, D.M., Adrian, T.E. Christofides, N.D., Lennard-Jones, J.E., + Bloom, S.R.

"Pancreatic polypeptide and motilin response in different types of functional bowel disease".

Scand. J. Gastroenterol., (1983),18, Suppl.82., 199-200.

107. Mendeloff, A.I.

"Fiber and the gastrointestinal tract : summary and recommendations".

Amer. J. Clin. Nutr. (1978), 31, 145-147.

108. Painter, N.S.

"Irritable or irritated bowel".

Brit. Med. J. (1972), 2, 46.

109. Thompson, W.G.

"The irritable bowel".

In "The irritable gut".

Baltimore. Univ. Park Press, (1979), 65-84

110. Kay, R.M.

"Dietary Fiber".

J. Lipid Res., (1982), 23, 221-242.

111. Robertson, J.A. + Eastwood, M.A.

"An examination of factors which affect the water-holding capacity of dietary fibre".

Brit. J. Nutr., (1981), 45, 83-88.

112. Whyman, J.B., Heaton, K.W. Manning, A.P. + Wicks, A.C.B.

"Variability of colonic function in healthy subjects".

Gut. (1978), 19, 145-151.

113. Goy, J.A.E., Eastwood, M.A. Mitchell, W.D., Pritchard, J.L. + Smith, A.N.

"Fecal characteristics contrasted in the irritable bowel syndrome and diverticular disease".

Amer. J. Clin. Nutr., (1976), 29, 1480-1484.

114. Eastwood,M.A., Walton, B.A., Brydon, W.G.,£ + Anderson, J.R.

"Faecal weight, constituents, colonic motility and lactose tolerance in the irritable bowel syndrome."

Digestion, (1984), 30, 7-12.

115. Hillman, L.C., Stace, N.H., Fisher, A. + Pomare, E.W.

"Dietary intakes and stool characteristics of patients with the irritable bowel syndrome".

Amer. J. Clin. Nutr. (1982), 36, 626-629.

116. Tucker, D.M., Sandstead, H.H., Logan, G.M., Klevay, L.M., Mahalko, J., Johnson, L.K. Inman, L. + Inglett, G.E.

"Dietary fibre and personality factors as determinants of stool output".

Gastroenterol., (1981), 81, 879-883.

117. Longstreth, G.F., Fox, D.D., Youkeles, L., Forsythe, A.B. + Wolochow, D.A.

"Psyllium therapy in the irritable bowel syndrome".

Ann. Int. Med. (1981), 95, 53-56.

118. Fielding, J.F. + Melvin, K.

"Dietary fibre and the irritable bowel syndrome".

J. Human Nutr., (1979), 33, 243-247.

119. Manning, A.P., Heaton, K.W., Harvey, R.F. + Uglow, P.

"Wheat fibre and irritable bowel syndrome".

Lancet, (1977), 2, 417-418.

120. Soltoft, J., Gumand-Hoyer, E. Krag, B., Kristensen, E., + Wulff, H.R.

"A double-blind trial of wheat bran on symptoms of irritable bowel syndrome".

Lancet, (1976), 1, 270-272.

121. Cann, P.A., Read, N.W. + Holdsworth, C.W.

"What is the benefit of coarse wheat bran in patients with irritable bowel syndrome?".

Gut, (1984), 25, 168-173.

122. Lasser, R.B., Bond, J.H., + Levitt, M.D.

"The role of intestinal gas in functional abdominal pain".

New Engl. J. Med., (1975), 293, 524-526.

123. Levitt, M.D., Lasser, R.B., Schwartz, J.S. + Bond, J.H.

"Studies of a flatulent patient".

New Engl. J. Med, (1976), 295, 260-262.

124. Levitt, M.D.

"Intestinal gas production - recent advances in flatology".

New. Engl. J. Med, (1980), 302, 1474-1475.

125. Anderson, I.H., Levine, A.S., + Levitt, M.D.

"Incomplete absorption of the carbohydrate in all purpose wheat flour".

New Engl. J. Med., (1981), 304, 891-892.

126. Pock-Steen, O.C.

"The role of gluten, milk and other dietary proteins in chronic or intermittent dyspepsia".

Clin. Allergy, (1973), 3, 373-383.

127. Ferguson, A.

"Diagnosis and treatment of lactose intolerance".

Brit. Med. J., (1981), 283, 1423-1424.

128. Ferguson, A., Macdonald, D.M. + Brydon, W.G.

"Prevalence of lactase deficiency in British adults".

Gut, (1984), 25, 163-167.

129. Weser, E., Rubin, W., Ross, L., + Sleisenger, M.H.

"Lactase deficiency in patients with the irritable colon syndrome".

New Engl. J. Med, (1965), 273, 1070-1075.

130. Gudmand-Hoyer, E., Riis, P. + Wulff, H.R.

"The significance of lactose malabsorption in the irritable colon syndrome".

Scand. J. Gastroent. (1973), 6, 273-278.

131. Pena, A.S. + Truelove, S.C.

"Hypolactasia and the irritable colon syndrome".

Scand. J. Gastroent., (1972), 7, 433-438.

132. Lessof, M.H., Wraith, D.G., Merrett, T.G. Merrett, T. + Buisseret, P.D.

"Food allergy and intolerance in 100 patients - local and systemic effects".

Quart. J. Med., (1980), 49, 259-271.

133. Alun Jones, V., McLaughlan, P., Shorthouse, M., Workman, E. + Hunter, J.O.

"Food intolerance : a major factor in the pathogenesis of irritable bowel syndrome".

Lancet, (1982), 2, 1115-1117.

134. Bentley, S.J., Pearson, D.J. + Rix, K.J.B.

"Food hypersensitivity in irritable bowel syndrome".

Lancet, (1983), 2, 295-297.

135. Alun Jones, V., Shorthouse, M. Workman, E. + Hunter, J.O.

"Food intolerance and the irritable bowel".

Lancet, (1983), 2, 633-634.

136. Pearson, D.J., Rix, K.J.B. + Bentley, S.L.

"Food allergy : how much in the mind? A clinical and psychiatric study of suspected food hypersensitivity".

Lancet, (1983), 1, 1259-1261.

137. Rix, K.J.B., Pearson, D.J. + Bentley, S.J.

"A psychiatric study of patients with supposed food allergy"

Brit. J. Psychiat., (1984), 145, 121-126

138. Farah, D.A., Calder, I. Benson, L. + MacKenzie, J.F.

"Specific food intolerance : its place as a cause of gastrointestinal symptoms"

Gut. (1985), 26, 164-168.

139. Lessof, M.H.

"Food intolerance and allergy - a review

Quart. J. Med. (1983), 52, 111-119.

140. Joint Committee of the Royal College of Physicians and the British Nutrition Foundation.

"Food intolerance and food aversion".

J. Roy. Coll. Phys. London (1984), 18, 83-123

141. Atkins, F.M. + Metcalfe, D.D.

"The diagnosis and treatment of food allergy.

Ann. Rev. Nutr. (1984), 4, 233-255.

142. Bordie, A.K.

"Functional disorders of the colon".

J. Indian Med. Assoc. (1972), 58, 451-456.

143. Cummings, J.H.

"Laxative abuse".

Gut (1974), 15, 758-766.

144. Crean,G.P., Card,W.I., Beattie,A.D., Holden,R.J., James,W.B., Knill-Jones,R.P. Lucas,R.W. + Spiegelhalter,D.

"Ulcer-like dyspepsia"

Scand. J. Gastroenterol. (1982),17, Suppl.79., 9-15.

145. Langman,M.J.S. + Bell,G.D.

"Alcohol and the gastrointestinal tract"

Brit.Med.Bull. (1982), 38, 71-76.

146. Nazer, H. + Wright, R.A.

"The effect of alcohol on the human alimentary tract : a review".

J. Clin. Gastroenterol, (1983), 5, 361-365.

147. Buchan, I.C., Buckley, E.G., Deacon, G.L.S., Irvine, R. + Ryan, M.P.

"Problem drinkers and their problems".

J. Roy. Coll. Gen. Pract. (1981), 31, 151-153.

148. Jarman, C.M.B. + Kellett, J.M.

"Alcoholism in the general hospital".

Brit. Med. J. (1979),2, 469-472.

149. Thompson, W.G.

"The irritable bowel".

Gut, (1984), 25 305-320.

150. Flynn. M., Hammond, P., Darby, C., Hyland, J., + Taylor, I.

"Faecal bile acids and the irritable colon syndrome".

Digestion, (1981), 22, 144-149.

151. Taylor, I. Basu, P., Hammond, P., Darby, C., + Flynn, M.

"Effect of bile acid perfusion on colonic motor function in patients with the irritable colon syndrome".

Gut, (1980), 21, 843-847.

152. Thaysen, E.H. + Pedersen, L.

"Idiopathic bile salt catharsis".

Gut. (1976), 17, 965-970.

153. Nyhlin, H., Merrick, M.V., Eastwood, M.A. + Brydon, W.G.

"Evaluation of ileal function using 23-selena-25 homotaurocholate, a x-labelled conjugated bile acid".

Gastroenterol. (1983), 84, 63-68.

154. Merrick, M.V., Eastwood, M.A. + Ford, M.J.

"Is bile acid malabsorption under diagnosed? An evaluation of accuracy of diagnosis by measurement of SeHCAT retention"

Brit. Med. J. (1985), 290, 665-668.

155. Hislop, I.G.

"Psychological significance of the irritable colon syndrome".

Gut, (1971), 12, 452-457.

156. Palmer, R.L., Stonehill, E., Crisp, A.H. Waller, S.L. + Misiewicz, J.J.

"Psychological characteristics of patients with the irritable bowel syndrome".

Postgrad. Med. J. (1974), 50, 416-419.

157. Crisp,A.H., Gaynor Jones,M., + Slater,P.

"The Middlesex Hospital Questionnaire : A validity study"

Brit.J.Med.Psychol. (1978),51, 269-280.

158. Crown,S. + Crisp,A.H.

"Manual of the Crown-Crisp Experiential Index"

London. Hodder + Stoughton. (1979).

159. Esler, M.D. + Goulton, K.J.

"Levels of anxiety in colonic disorders".

New Engl. J. Med., (1973), 288, 16-20.

160. Wright, J.T. + Das, A.K.

"Excretion of 4-hydroxy-3 methoxy mandelic acid in cases of ulcerative colitis and diarrhoea of nervous origin".

Gut, (1969), 10, 628-630.

161. Liss, J.L., Alpers, D. + Woodruff, R.A.

"The irritable colon syndrome and psychiatric illness".

Dis. Nerv. Sys. (1973), 34, 151-157.

162. Fava, G.A. + Pavan, L.

"Large bowel disorders. II. Psychopathology and alexithymia".

Psychother. Psychosom., (1976), 27, 100-105.

163. Heefner, J.D., Wilder, R.M. + Wilson, I.D.

"Irritable colon and depression".

Psychosom. (1978), 19, 540-547.

164. Goldberg, D.P., + Blackwell, B.

"Psychiatric illness in general practice. A detailed study using a new method of case identification".

Brit. Med. J. (1970), 2, 439-443.

165. Goldberg, D.

"A psychiatric study of patients with diseases of the small intestine".

Gut. (1970), 11, 459-465.

166. Waller S.L. + Misiewicz, J.J.

"Prognosis in the irritable bowel syndrome. A prospective study".

Lancet, (1969), 2, 753-756.

167. Sullivan, S.N.

"Management of the irritable bowel syndrome : a personal view".

J. Clin. Gastroenterol. (1983), 5, 499-502.

168. Svedlund, J., Sjodin, I., Ottosson, J.O., + Dotevall, G.

"Controlled study of psychotherapy in irritable bowel syndrome".

Lancet, (1983), 2, 589-591.

169. Svedlund, J.

"Psychotherapy in irritable bowel syndrome. A controlled outcome study".

Acta Psychiat. Scand. (1983) 67, Suppl. 306, 1-86.

170. Hislop, I.G.

"Effect of very brief psychotherapy on the irritable bowel syndrome".

Med. J. Aust. (1980), 2, 620-623.

171. Myren, J., Groth, H., Larssen, S.E. + Larsen, S.

"The effect of trimipramine in patients with the irritable bowel syndrome. A double-blind study".

Scand. J. Gastroenterol. (1982), 17, 871-875.

172. Latimer, P.R.

"Psychophysiologic disorders : a critical appraisal of concept and theory with reference to the irritable bowel syndrome".

Psychol. Med. (1979), 9, 71-80.

173. Latimer, P.R.

"Irritable bowel syndrome : a behavioral model".

Behav. Res. Ther., (1981), 19, 475-483.

174. Latimer, P.R.

"Biofeedback and behavioral approaches to disorders of the gastrointestinal tract".

Psychother. Psychosom., (1981), 36, 200-212.

175. Brown, G.W. + Harris, T.

"Social origins of Depression. A study of psychiatric disorder in women".

Londen. Tavistock. (1978), 63-129.

176. Kirsner, J.B.

"The irritable bowel syndrome. A clinical review and ethical considerations".

Arch. Intern. Med. (1981), 141, 635-639.

177. Hislop, I.G.

"Childhood deprivation. An antecedent of the irritable bowel syndrome".

Med. J. Aust., (1979), 1, 372-374.

178. Fava, G.A. + Pavan, L.

"Large bowel disorders. I. Illness configuration and life events".

Psychother. Psychosom. (1976), 27, 93-99.

179. Holmes,T.H. + Rahe,R.H.

"The social readjustment rating scale"

J. Psychosom.Res. (1967), 11, 213-218.

180. Mendeloff, A.I., Monk, M., Siegel, C.I., + Lilienfield, A.

"Illness experience and life stresses in patients with irritable colon and with ulcerative colitis".

New Engl. J. Med. (1970), 282, 14-17.

181. Hill, O.W. + Blendis, L.

"Physical and psychological evaluation of "non-organic" abdominal pain".

Gut, (1967), 8, 221-229.

182. Harding, H.E.

"A notable source of error in the diagnosis of appendicitis".

Brit. Med. J., (1962), 2, 1028-1029.

183. Barraclough, B.M.

"Appendectomy in women".

J. Psychosom. Res., (1968), 12, 231-234.

184. Creed, F.

"Life events and appendicectomy".

Lancet, (1981), 1, 1381-1385.

185. Brown,G.W. + Harris,T.

"Social origins of depression. A study of psychiatric disorder in women".

London. Tavistock. (1978) 1-59.

186. Miller,P.McC., Ingham,J.G. + Davidson,S.

"Life events, symptoms and social support".

J. Psychosom. Res., (1976), 20, 515-522

187. Finlay-Jones,R. + Brown,G.W.

"Types of stressful life event and the onset of anxiety and depressive disorders".

Psychol.Med. (1981), 11, 803-815.

188. Ford, M.J., Eastwood, J. + Eastwood, M.A.

"The irritable bowel syndrome : soma and psyche".

Psychol. Med., (1982), 12, 705-707.

189. Ivey, K.J.

"Are anticholinergics of use in the irritable colon syndrome".

Gastroenterol., (1975), 68, 1300-1307.

190. Leading article

"Management of the irritable bowel".

Lancet, (1978), 2, 557-558.

191. Piai, G. + Mazzacca, G.

"Prifinium bromide in the treatment of the irritable bowel syndrome".

Gastroenterol. (1979), 77, 500-502.

192. Greenbaum, D.S., Ferguson, R.K., Kater, L.A, Kniper, D.H. + Rosen, L.W.

"A controlled therapeutic study of the irritable bowel syndrome. Effect of diphenylhydantoin".

New Engl. J. Med., (1973), 288, 13-16.

193. Rees, W.D.W., Evans, B.K. + Rhodes, J.

"Treating irritable bowel syndrome with peppermint oil".

Brit. Med. J. (1979), 2, 835-836.

194. Deutsch, E.

"Relief of anxiety and related emotions in patients with gastrointestinal disorders".

Amer. J. Dig. Dis, (1971), 16, 1091-1094.

195. Ritchie, J.A. + Truelove, S.C.

"Treatment of irritable bowel syndrome with lorazepam, hyoscine butylbromide and ispaghula husk".

Brit. Med. J. (1979), 1, 376-378.

196. Ritchie, J.A. + Truelove, S.C.

"Comparison of various treatments for irritable bowel syndrome".

Brit. Med. J., (1980), 281, 1317-1319.

197. Steinhart, M.J., Wong, P.Y. + Zarr, M.L.

"Therapeutic usefulness of amitriptyline in spastic colon syndrome".

Int. J. Psychiat. Med. (1981), 11, 45-57.

198. Fitzpatrick, R.M. + Hopkins, A.P.

"Effects of referral to a specialist for headache".

J. Roy. Soc. Med., (1983), 76, 112-115.

199. Holmes, K.M. + Salter, R.H.

"Irritable bowel syndrome - a safe diagnosis".

Brit. Med. J. (1982), ,285, 1533-1534.

200. Keeling, P.W.N. + Fielding, J.F.

"The irritable bowel syndrome. A review of 50 consecutive cases".

J. Irish Coll. Phys. Surg. (1975), 4, 91-94.

201. Apley, J. + Hale, B.

"Children with recurrent abdominal pain : how do they grow up?"

Brit. Med. J. (1973), 3, 7-9.

202. Christensen, M.F. + Mortensen, O.

"Long term prognosis in children with recurrent abdominal pain?".

Arch. Dis. Child., (1975), 50, 110-114.

203. Stone, R.T. + Barbero, G.J.

"Recurrent abdominal pain in childhood".

Paediat. (1970), 45, 732-738.

204. Oster, J.

"Recurrent abdominal pain, headache and limb pains in children".

Paediat., (1972), 50, 429-436.

205. Wooley, S.C., Blackwell, B. + Winget, C.

"The learning theory model of chronic illness behaviour : theory, treatment and research".

Psychosom. Med. (1978), 40, 379-401.

206. Miller. N.E.

"Effect of learning on gastrointestinal functions".

Clin. Gastroenterol. (1977), 6, 533-546.

207. Whitehead, W.E., Winget, C., Fedoravicins, A.S., Wooley, S. + Blackwell, B.

"Leaned illness behaviour in patients with irritable bowel syndrome and peptic ulcer".

Dig. Dis. Sci. (1982), 27, 202-208.

208. Davidson, M. + Wasserman, R.

"The irritable colon of childhood". (Chronic non-specific diarrhoea syndrome).

J. Pediat., (1966), 69, 1027-1038.

209. Rahe, R.H.

"The pathway between subjects' recent life changes and their near future illness reports : representative results and methodological issues".

In "Stressful Life Events. Their nature and effects"

Ed. Dohrenwend B.S. + Dohrenwend, B.P. New York. Wiley., (1974), 73-86.

210. Woodcock, A. + Davis, M.

"Catastrophe theory".

London. Penguin. (1978) pp. 171.

211. Zeeman, E.C.

"Catastrophe theory".

Sci. Amer. (1976), 234, 65-83.

212. Stewart, I.N. + Peregoy, P.L.

"Catastrophy theory modeling in psychology".

Psychol. Bull. (1983), 94, 336-362.

213. Office of Population Censuses and Surveys

"Classification of Occupations" London. HMSO. (1970)

214. Manning,A.P., Wyman,J.B. + Heaton,K.W.

"How trustworthy are bowel histories? Comparison of recalled and recorded information. Brit. Med.J.(1976),2, 213-214

215. Lawson,M.J., Grant,A.K., Paull,A + Read,T.R.

"Significance of nocturnal abdominal pain : a prospective study"

Brit.Med.J.(1980), 280, 1302.

216. Lader,M., + Marks,I.

"The measurement of anxiety"
In "Clinical anxiety"

London. Heinemann. (1971), 82-108.

217. Hoepler,E.W., Nycz,G.R., Kessler,L.G.
Burke,J.D. + Pierce,W.E.

"The usefulness of screening for
mental illness".

Lancet (1984), (1), 33-35.

218. Wing,J.K., Mann,S.A., Leff,L.P.,
+ Nixon,J.M.

"The concept of a "Case" in psychiatric
population surveys"

Psychol. Med.(1978) 8, 203-217.

219. Ingham,J.G. + Miller,P.McC.

"The concept of prevalence applied to
psychiatric disorders and symptoms".

Psychol. Med., (1976), 6. 217-225.

220. Ingham,J.G.

"A method for observing symptoms and
attitudes"

Brit. J. Soc. Clin. Psychol. (1965), 4, 131-140

221. Chick,J.

"Epidemiology of alcohol use and its hazards"

Brit. Med. Bull. (1982), 38, 3-8.

222. Leading article

"Screening tests for alcoholism"

Lancet (1980), 2,1117-1118.

223. Bernardt,M.W., Mumford,J., Taylor,C., Smith,B. + Murray, R.M.

"Comparison of questionnaire and laboratory tests in the detection of excessive drinking and alcoholism"

Lancet (1982),1, 325-328.

224. Selzer,M.L.

"The Michigan Alcoholism Screening Test : The Quest for a new diagnostic instrument"

Amer. J. Psychiat. (1971), 127, 1653-1658.

225. Skinner,H.A.

"A multivariate evaluation of the MAST"

J. Stud. Alcohol. (1979), 40, 831-844.

226. Zung, B.J.

"Evaluation of the Michigan alcoholism screening test (MAST) in assessing lifetime and recent problems".

J. Clin. Psychol. (1982), 38, 425-439.

227. Moore, R.A.

"The diagnosis of alcoholism in a psychiatric hospital : a trial of the Michigan Alcoholism Screening Test (MAST)".

Amer. J. Psychiat. (1972), 128, 1565-1569.

228. Wing,J.K., Cooper,J.E. + Sartorius N.

"The measurement and classification of psychiatric symptoms".

London. Cambridge Univ. Press. (1974).

229. Wing, J.K.

"Use and misuse of the PSE"

Brit. J. Psychiat., (1983), 143, 111-117.

230. World Health Organisation

"Glossary of Mental Disorders and Guide to their classification"

Geneva. WHO.(1974).

231. Spitzer, R.L., Endicott, J. + Robins, E.

"Research diagnostic criteria. Rationale and reliability".

Arch. Gen. Psychiat. (1978), 35, 773-782.

232. Surtees, P.G., Dean, C., Ingham, J.G., Kreitman, N.B., Miller, P McC + Sashidharan, S.

"Psychiatric disorder in women from an Edinburgh community : associations with demographic factors"

Brit. J. Psychiat., (1983), 142, 238-246.

233. Dean, C., Surtees, P.G. + Sashidharan, S

"Comparison of research diagnostic systems in an Edinburgh community sample"

Brit, J. Psychiat., (1983), 142, 247-256.

234. Rahe,R.H., Meyer,M., Smith,M., Kjaer,G., + Holmes,T.H.

"Social stress and illness onset"

J. Psychosom. Res. (1964), 8, 35-44

235. Skinner,H. + Lei,H.

"Differential weights in life change research : useful or irrelevant?".

Psychosom.Med. (1980),42, 367-370

236. Rabkin,J.G. + Struening,E.L.

"Life events, stress and illness"

Science, (1976), 194, 1013-1020

237. Miller,P.McC. + Ingham,J.G.

"Dimensions of experience"

Psychol. Med. (1983), 13, 417-429.

238. Miller, P. McC. + Ingham, J.G.

"Dimensions of experience and symptomatology"

J. Psychosom. Res., (1985), 29, IN PRESS

239. Jenkins,C.D., Hurst,M.W. + Rose,R.M.

"Life changes : do people really remember?"

Arch. Gen. Psychiat., (1979), 36, 379-384.

240. Steele,G.P., Henderson,S. + Duncan-Jones,P.

"The reliability of reporting adverse experiences"

Psychol.Med. (1980), 10, 301-306.

241. Brown,G.W.

"Meaning, measurement and stress of life events.

In. "Stressful life events : their nature and effects".

Ed. Dohrenwend,B.S., + Dohrenwend,B.P. New York. Wiley. (1974), 217-243.

242. Miller,P.McC. + Ingham,J.G.

"Friends, Confidants and symptoms".

Soc. Psychiat., (1976), 11, 51-58.

243. "Biomedical Programs BMDP statistical Software".

Ed. Dixon, W.J. Los Angeles. Univ. Calif. Press, (1981), pp 726.

244. Maxwell, A.E.

"Multivariate Analysis in Behavioural research".

London. Chapman + Hall., (1977), 136-152

245. Kruis, W. 'Thieme, C.H., Wienzierl, M. Schussler, P., Holl.J + Paulus,W.

"A diagnostic score for the irritable bowel syndrome. Its value in the exclusion of organic disease".

Gastroenterol (1984), 87, 1-7.

246. Sandler, R.S., Drossman, D.A., Nathan, H.P. + McKee, D.C.

"Symptom complaints and health care seeking behaviour in subjects with bowel dysfunction".

Gastroenterol., (1984), 87, 314-318.

247. Leading Article

"Heartburn and globus : pathological, functional or normal?"

Lancet (1982), 1, 604-605.

248. Clouse, R.E. + Lustman, P.J.

"Psychiatric illness and contraction abnormalities of the esophagus".

New Engl. J. Med. (1983), 309, 1337-1342.

249. Whorwell, P.J. Prior, A. + Faragher, E.B.

"Controlled trial of hypnotherapy in the treatment of severe refractory irritable bowel syndrome".

Lancet, (1984), 2, 1232-1233.

250. Leading article

"An irritable mind or an irritable bowel".

Lancet, (1984), 2, 1249-1250.

FIGURES

FIGURE 1: LINEAR MODEL OF THE RELATIONSHIP BETWEEN LIFE EVENTS AND ILLNESS (RAHE)

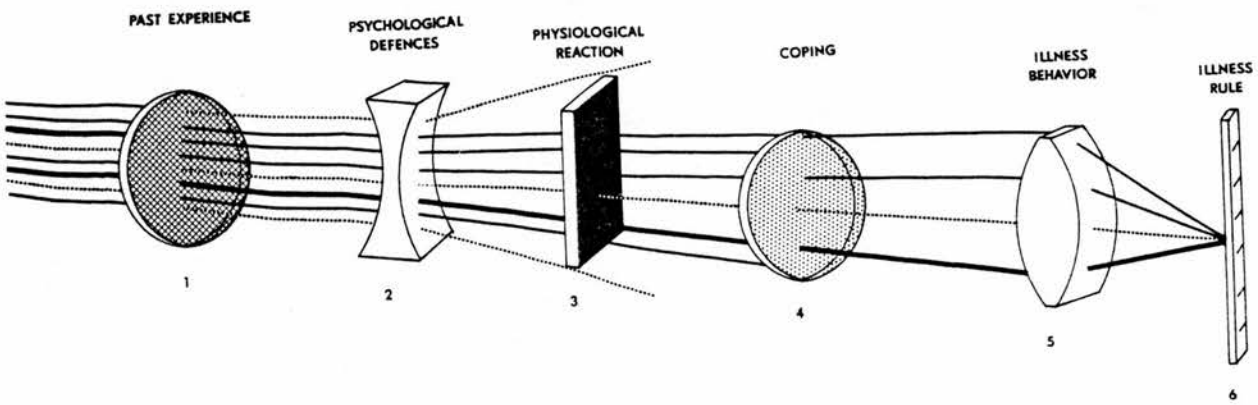


FIGURE 2: CATASTROPHE MODEL OF THE IRRITABLE BOWEL SYNDROME

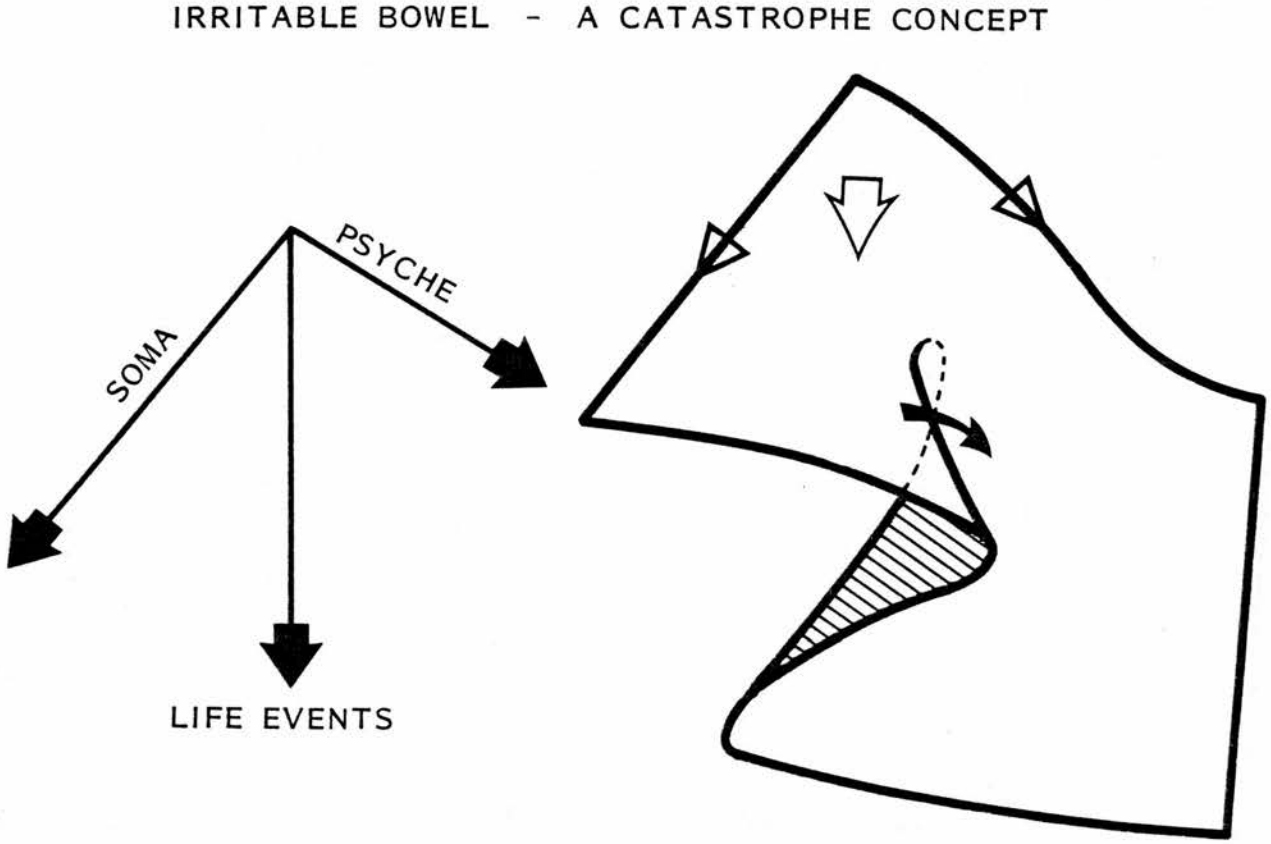
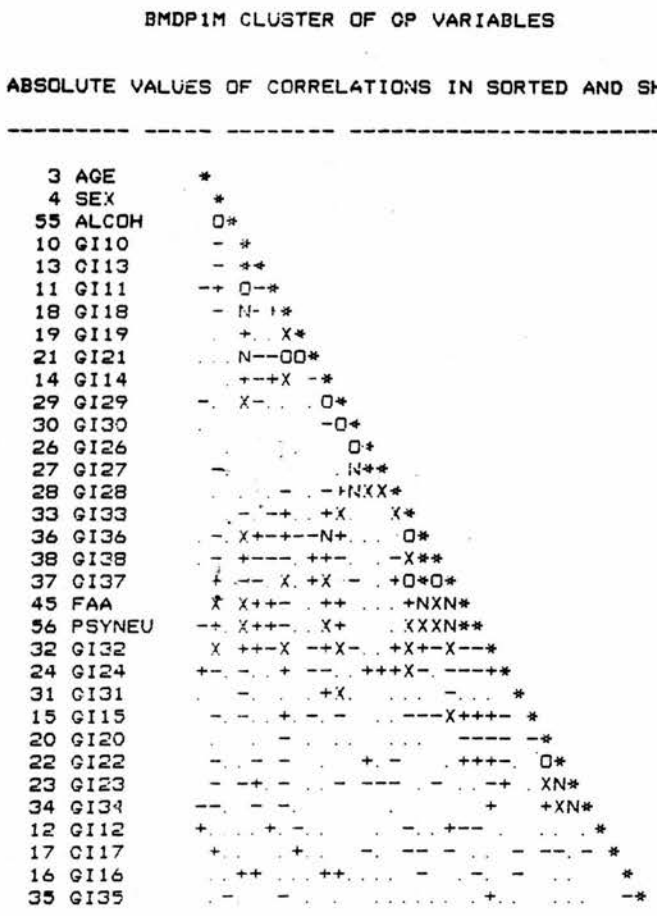


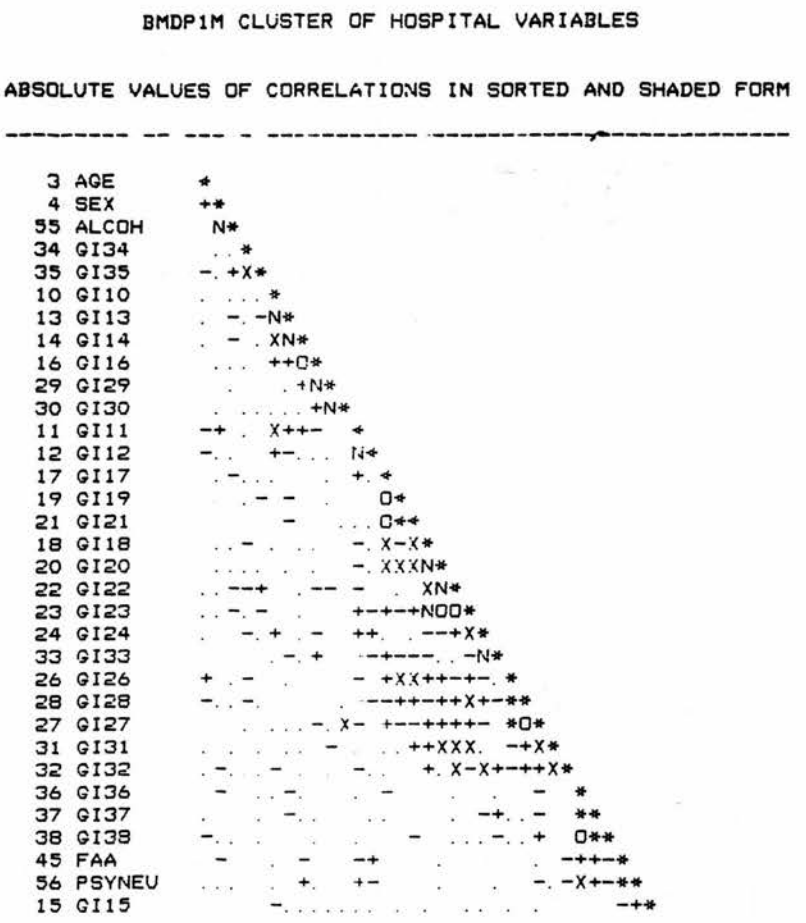
FIGURE 3: CLUSTER ANALYSIS OF GI SYMPTOMS (GP GROUP)



THE ABSOLUTE VALUES OF
THE MATRIX ENTRIES HAVE BEEN PRINTED ABOVE IN SHADED FORM
ACCORDING TO THE FOLLOWING SCHEME

	LESS THAN OR EQUAL TO		0.075
.	0.075	TO AND INCLUDING	0.151
-	0.151	TO AND INCLUDING	0.226
+	0.226	TO AND INCLUDING	0.301
X	0.301	TO AND INCLUDING	0.377
N	0.377	TO AND INCLUDING	0.452
O	0.452	TO AND INCLUDING	0.527
*		GREATER THAN	0.527

FIGURE 4: CLUSTER ANALYSIS OF GI SYMPTOMS (HOSPITAL GROUP)



THE ABSOLUTE VALUES OF
THE MATRIX ENTRIES HAVE BEEN PRINTED ABOVE IN SHADED FORM
ACCORDING TO THE FOLLOWING SCHEME

	LESS THAN OR EQUAL TO		0.079
.	0.079	TO AND INCLUDING	0.157
-	0.157	TO AND INCLUDING	0.236
+	0.236	TO AND INCLUDING	0.315
X	0.315	TO AND INCLUDING	0.394
N	0.394	TO AND INCLUDING	0.472
O	0.472	TO AND INCLUDING	0.551
*		GREATER THAN	0.551

APPENDIX I THE CLINICAL GI SYMPTOM QUESTIONNAIRE

CONFIDENTIAL

Hospital Unit No. | | | | | | |

Age | | |

Sex | |

Marital Status | |

Occupational Status | |

Duration of symptoms | | |

Diagnosis | | |

GI Questionnaire | | | | | | | |

Middlesex Hospital Questionnaire | | | | | | | |

Present State | | |

MAST | | |

TRIAL NO.

1	Number of appointments since first referral	0 None 1 1 - 3 2 4 +
2	Do you ever feel nauseated, sick or squeamish?	0 Never 1 Occasionally 2 Most months 3 Most weeks 4 Most days
3	Do you ever lose your appetite for food?	0 Never 1 Occasionally 2 Most months 3 Most weeks 4 Most days
4	Do you ever lose weight without consciously trying to diet?	0 Never 1 Less than 7lbs 2 Between 7lbs - 1 stone 3 Over 1 stone
5	Do you ever vomit?	0 Never 1 Occasionally 2 Most months 3 Most weeks 4 Most days
6	Do you ever have a sour or acid taste in your mouth?	0 Never 1 Occasionally 2 Most months 3 Most weeks 4 Most days
7	Do you ever feel a lump in your throat that is difficult to swallow?	0 Never 1 Occasionally 2 Most months 3 Most weeks 4 Most days

8 Do you ever get heartburn?
(A hot discomfort behind the breastbone)

0 Never
1 Occasionally
2 Most months
3 Most weeks
4 Most days

---

9 How many bowel movements do you usually have per day or per week?

---

10 Do you ever see slime with the motions or on the toilet paper?

0 Never
1 Occasionally
2 Most months
3 Most weeks
4 Most days

---

11 Do you ever have to rush to the toilet to open your bowels?

0 Never
1 Occasionally
2 Most months
3 Most weeks
4 Most days

---

12 Are your motions ever like dry pellets or thin strips?

0 Never
1 Occasionally
2 Most months
3 Most weeks
4 Most days

---

13 Are your motions ever watery or unformed?

0 Never
1 Occasionally
2 Most months
3 Most weeks
4 Most days

---

14 Do you ever have to strain during a bowel motion?

0 Never
1 Occasionally
2 Most months
3 Most weeks
4 Most days

15	Do you ever feel the bowel is not quite empty after a bowel motion?	0 Never 1 Occasionally 2 Most months 3 Most weeks 4 Most days
16	Do you ever experience pain in the tummy (that is not due to your monthly period?)	0 Never 1 Occasionally 2 Most months 3 Most weeks 4 Most days
17	Is the tummy pain or discomfort mostly in the ?	1 Upper half of your tummy 2 Lower half of your tummy 3 Right side of your tummy 4 Left side of your tummy
18	Is the tummy pain changed by opening your bowels?	0 Never 1 Occasionally 2 Usually
19	Is the tummy pain changed by passing wind from the back passage?	0 Never 1 Occasionally 2 Usually
20	Does the tummy pain coincide with a change in shape, consistency or frequency of the bowel motions?	0 Never 1 Occasionally 2 Usually
21	Is belching a problem?	0 Never 1 Occasionally 2 Most weeks 3 Most days 4 Throughout the day

22	Is the tummy pain changed by belching?	0 Never 1 Occasionally 2 Usually
23	Is passing wind via the back passage a problem?	0 Never 1 Occasionally 2 Most weeks 3 Most days 4 Throughout the day
24	Apart from after large meals, do you ever feel your tummy to be distended or 'blown out'?	0 Never 1 Occasionally 2 Most months 3 Most weeks 4 Most days
25	Are you ever woken from sleep because of tummy pain or the desire to open your bowels?	0 Never 1 Occasionally 2 Most months 3 Most weeks 4 Most days
26	Do you ever use laxatives or purgatives? Which brand?	0 Never 1 Occasionally 2 Most months 3 Most weeks 4 Most days
27	Do you make a conscious effort to take a breakfast cereal high in roughage?	0 Never 1 Most weeks 2 Most days
28	Do you ever have to rush to the toilet to pass urine?	0 Never 1 Occasionally 2 Most months 3 Most weeks 4 Most days

29 Do you ever have to pass urine more often than usual?

0 Never
1 Occasionally
2 Most months
3 Most weeks
4 Most days

---

30 Are you ever woken from sleep because of a desire to pass urine?

0 Never
1 Occasionally
2 Most months
3 Most weeks
4 Most days

---

31 Have you ever had any of the following allergic disorders?

1 Asthma
2 Hay fever/rhinitis
3 Eczema/dermatitis
4 No

---

32 Do you ever feel worry or 'nerves' upset your tummy complaint?

0 Never
1 Occasionally
2 Usually

---

33 Do you ever see your G.P. because of trouble with your "nerves"?

0 Never
1 Occasionally
2 Often

---

34 Does your tummy trouble ever keep you from your job or housework?

0 Never
1 Occasionally
2 5 - 10 days/year
3 10 - 28 days/year
4 More than 28 days/year

---

35 Do you ever worry that your tummy trouble might be due to cancer?

0 Never
1 Occasionally
2 Often

Do you smoke cigarettes regularly ?

0 No
1 Yes

APPENDIX II THE PSYCHONEUROTIC PROFILE QUESTIONNAIRE (CCEI)

QUESTIONS CONCERNING THE WAY YOU FEEL OR ACT

(1) 36 Do you often feel upset for no obvious reason?
Yes
No

---

(2) 37 Do you have an unreasonable fear of being in enclosed spaces such as shops, lifts etc.?
Often
Sometimes
Never

---

(3) 38 Do people ever say you are too conscientious?
No
Yes

---

(4) 39 Are you troubled by dizziness or shortness of breath?
Never
Often
Sometimes

---

(5) 40 Can you think as quickly as you used to?
Yes
No

---

(6) 41 Are your opinions easily influenced?
Yes
No

---

(7) 42 Have you felt as though you might faint?
Frequently
Occasionally
Never

---

(8) 43 Do you find yourself worrying about getting some incurable illness?
Never
Sometimes
Often

---

(9) 44 Do you think that "cleanliness is next to godliness"?
No
Yes

---

(10) 45 Do you often feel sick or have indigestion?
Yes
No

---

(11)	46	Do you feel that life is too much effort?	At times Often Never
(12)	47	Have you, at any time in your life, enjoyed acting?	Yes No
(13)	48	Do you feel uneasy and restless?	Frequently Sometimes Never
(14)	49	Do you feel more relaxed indoors?	Definitely Sometimes Not particularly
(15)	50	Do you find that silly or unreasonable thoughts keep recurring in your mind?	Frequently Sometimes Never
(16)	51	Do you sometimes feel tingling or pricking sensations in your body, arms or legs?	Rarely Frequently Never
(17)	52	Do you regret much of your past behaviour?	Yes No
(18)	53	Are you normally an excessively emotional person?	Yes No
(19)	54	Do you sometimes feel really panicky?	No Yes
(20)	55	Do you feel uneasy travelling on buses or the underground even if they are not crowded?	Very A little Not at all
(21)	56	Are you happiest when you are working?	Yes No

(22) 57 Has your appetite got less recently?

No
Yes

---

(23) 58 Do you wake unusually early in the morning?

Yes
No

---

(24) 59 Do you enjoy being the centre of attention?

No
Yes

---

(25) 60 Would you say you were a worrying person?

Very
Fairly
Not at all

---

(26) 61 Do you dislike going out alone?

Yes
No

---

(27) 62 Are you a perfectionist?

No
Yes

---

(28) 63 Do you feel unduly tired and exhausted?

Often
Sometimes
Never

---

(29) 64 Do you experience long periods of sadness?

Never
Often
Sometimes

---

(30) 65 Do you find that you take advantage of circumstances for your own ends?

Never
Sometimes
Often

---

(31) 66 Do you often feel 'strung-up' inside?

Yes
No

---

(32) 67 Do you worry unduly when relatives are late coming home?

No
Yes

---

(33)	68	Do you have to check things you do to an unnecessary extent?	Yes No
(34)	69	Can you get off to sleep alright at the moment?	No Yes
(35)	70	Do you have to make a special effort to face up to a crisis or difficulty?	Very much so Sometimes No more than anyone else
(36)	71	Do you spend a lot of money on clothes?	Yes No
(37)	72	Have you ever had the feeling that you are "going to pieces"?	Yes No
(38)	73	Are you scared of heights?	Very Fairly Not at all
(39)	74	Does it irritate you if your normal routine is disturbed?	Greatly A little Not at all
(40)	75	Do you often suffer from excessive sweating or fluttering of the heart?	No Yes
(41)	76	Do you find yourself needing to cry?	Frequently Sometimes Never
(42)	77	Do you enjoy dramatic situations?	Yes No
(43)	78	Do you have bad dreams which upset you when wake up?	Never Sometimes Frequently

(44)	79	Do you feel panicky in crowds?	Always Sometimes Never
(45)	80	Do you find yourself worrying unreasonably about things that do not really matter?	Never Frequently Sometimes
(46)	81	Has your sexual interest altered?	Less The same or greater
(47)	82	Have you lost your ability to feel sympathy for other people?	No. Yes
(48)	83	Do you sometimes find yourself posing or pretending?	Yes No

PRESENT STATE

THINK ABOUT HOW YOU HAVE BEEN FEELING DURING THIS PAST MONTH

84 ANXIETY

1 I never worry about anything

2 I get a bit worried occasionally

3 I often get worried about things

4 I tend to worry a great deal

5 I am always in a state of terrible worry and anxiety

---

85 DEPRESSION

1 I never feel unhappy

2 I sometimes feel a bit unhappy

3 I am quite often in low spirits

4 I frequently feel very miserable

5 I always feel very miserable and depressed.

APPENDIX III THE MICHIGAN ALCOHOLISM SCREENING TEST (MAST)

QUESTIONS CONCERNING YOUR ALCOHOL CONSUMPTION

86	Do you feel you are a normal drinker?	Yes No
87	Have you ever awakened the morning after some drinking the night before and found that you could not remember a part of the evening before?	No Yes
88	Does your spouse (or parents) ever worry or complain about your drinking?	No Yes
89	Can you stop drinking without a struggle after one or two drinks?	Yes No
90	Do you ever feel bad about your drinking?	No Yes
91	Do friends or relatives think you are a normal drinker?	Yes No
92	Are you always able to stop drinking when you want to?	Yes No
93	Have you ever attended a meeting of Alcoholics Anonymous (AA) because of your drinking	No Yes
94	Have you got into fights when drinking?	No Yes
95	Has drinking ever created problems with you and your spouse?	No Yes
96	Has your spouse (or other family members) ever gone to anyone for help about your drinking?	No Yes

97	Have you ever lost friends or girlfriends/ boyfriends because of drinking?	Yes No
98	Have you ever been in trouble at work because of drinking?	Yes No
99	Have you ever lost a job because of drinking?	Yes No
100	Have you ever neglected your obligations, your family, or your work for two or more days in a row because you were drinking?	Yes No
101	Do you ever drink before noon?	Yes No
102	Have you ever been told you have liver trouble? Cirrhosis?	Yes No
103	Have you ever had delirium tremens (DTs) severe shaking, heard voices, or seen things that were not there after heavy drinking?	Yes No
104	Have you ever gone to anyone for help about your drinking?	Yes No
105	Have you ever been in hospital because of drinking?	Yes No
106	Have you ever been a patient in a psychiatric hospital or on a psychiatric ward of a general hospital where drinking was part of the problem?	Yes No
107	Have you ever been seen at a psychiatric or mental health clinic, or gone to a doctor, social workers, or clergymen for help with an emotional problem in which drinking had played a part?	Yes No
108	Have you ever been arrested, even for a few hours, because of drunk behaviour?	Yes No
109	Have you ever been arrested for drunk driving or driving after drinking?	Yes / No

APPENDIX IV THE PSYCHIATRIC ASSESSMENT SCHEDULE (PAS)

Code No. [ ][ ][ ] (1 2 3) Card [1] (4)

DATE [ ][ ][ ][ ][ ][ ] (5 6 7 8 9 10) TIME START (24 hour clock) [ ][ ][ ][ ] (11 12 13 14) TIME FINISH [ ][ ][ ][ ] (15 16 17 18)

INTERVIEWER _____ [ ][ ] (19 20)

DATE OF BIRTH [ ][ ][ ][ ][ ][ ] (21 22 23 24 25 26)

PRESENT MARITAL STATUS [ ] (27) Single 1 Living with Husband 2 Widowed 3 Separated 4 Divorced 5 Cohabiting (check later in interview) 6

YEARS MARRIED (OR COHABITING) [ ][ ] (28 29)

OCCUPATION/EMPLOYMENT STATUS OF SUBJECT AND PRESENT HUSBAND (IF ANY). IF NOT RECORD FOR EX-HUSBAND, OR IF S UNMARRIED, FATHER.

Economic position

Employed full-time	1
Employed part-time	2
Not employed - sick	3
Not employed - seeking work or waiting to take up job	4
Retired	5
Permanently sick or disabled	6
Student (full-time)	7
Others economically inactive	8

Employment status

Self-employed	1
Employer or manager in large enterprise (employing 25 or more)	2
Employer or manager in small enterprise (less than 25 but do not include family workers)	3
Foreman or supervisor	4
Employee	5

Subject [ ] (30) Subject [ ] (31)

Husband/Father [ ] (32) Husband/Father [ ] (33)

Detailed description of job (last job if not currently employed)

Subject _____

_____ [ ][ ] (34 35)

If part-time, number of hours worked per week [ ][ ] (36 37)

Husband/Father _____

_____ [ ][ ] (38 39)

If part-time, number of hours worked per week [ ][ ] (40 41)

OTHER PEOPLE PRESENT (enter who this is) _____

_____

no 1 yes 2 [ ] (42)

1. INTRODUCTION

The interviewer should introduce himself briefly, describe the purpose of the interview and explain about any recording equipment. The purpose of the introductory section is to obtain an overall picture of the symptomatology, in the subject's own words.

** To begin with, I should like to get an idea of any problems that have been troubling you during the past month. What have been the main difficulties?

Record the main symptoms spontaneously mentioned.

Means of exploration, if subject gives inadequate information:

If subject's statement too brief - Can you tell me more about that?

If subject has no more to add - What else has been troubling you?

If statements are difficult to understand - Can you explain what you mean by .....?

If subject is vague - Could you give an example of .....?

If no other response forthcoming - Why did you come to the (hospital)?

RATE PATIENT'S ACCOUNT OF SYMPTOMS

0 = Subject responds adequately.
1 = Account somewhat inadequate but interview can proceed.
2 = Account seriously inadequate but interview proceeds in an attempt to rate some subjective responses, as well as behaviour, affect and speech.
3 = Impossible to continue with interview. Only behaviour, affect and speech sections rated.

REASONS FOR INADEQUACY (TICK AS MANY AS APPROPRIATE)

Denial or guardedness	_____	Inattention	_____
Incoherence	_____	Refusal	_____
Irrelevance	_____	Patient mute, stuporous, etc.	_____
Replies too brief	_____	Other, specify	_____
Poverty of content of speech	_____		

2. HEALTH, WORRYING, TENSION

** Is your physical health good?
(Does your body function normally?)

** Do you feel you are physically ill in any way?
(What is that like? How serious is it?)

RATE SUBJECT'S OWN SUBJECTIVE EVALUATION OF PRESENT PHYSICAL HEALTH
(Irrespective of whether physical disease is present.)

0 = Feels physically fit.
1 = Feels no particular physical complaint but does not say positively feels fit.
2 = Feels unwell but not seriously incapacitated. ☐ (11)
3 = Feels seriously incapacitated by physical illness.

** Have you had a physical illness recently; colds, influenza?

Or, if appropriate - What does your doctor say is wrong?

RATE PRESENCE OF PHYSICAL ILLNESS OR HANDICAP, taking results of recent investigations and physical state examination into account.

0 = No physical illness or handicap present.
1 = Mild but significant physical illness or handicap (.e.g. influenza or limp).
2 = More serious physical illness or handicap present but not incapacitating or threatening to life (e.g. deafness or duodenal ulcer). ☐ (12)
3 = Physical illness or handicap present which is incapacitating or threatening to life (e.g. blindness or carcinoma).

[9] (13)

(51) [9]

** Have you worried a lot during the past month?

PROBE: (Money, housing, children, health, work, marriage, relatives, friends, neighbours, other.)

(How much do you worry? Are you a worrier?)

If any indication of worry, use further probes:

** What is it like when you worry?
(What sort of state of mind do you get into?)
(Do unpleasant thoughts constantly go round and round in your mind?)
(Can you stop them by turning your attention to something else?)

RATE WORRYING: A round of painful thought which cannot be stopped and is out of proportion to the subject worried about.

1 = Symptom definitely present during past month, but of moderate clinical intensity or intense less than 50% of the time.
2 = Symptom clinically intense more than 50% of the month.

☐ (14)

** Have you had headaches, or other aches or pains, during the past month? (What kind?)

RATE ONLY TENSION PAINS, e.g. 'band round head', 'pressure', 'tightness in scalp', 'ache in back of neck', etc., not migraine.

1 = Symptom definitely present during past month, but of moderate clinical intensity, or intense less than 50% of the time.
2 = Symptom clinically intense more than 50% of past month.

☐ (15)

** Have you been getting exhausted and worn out during the day or evening, even when you haven't been working very hard?

RATE TIREDNESS OR EXHAUSTION: Do not include tiredness due to 'flu, etc. = 9

1 = Only moderate form of symptom (tiredness) present; or intense form (exhaustion) less than 50% of the time.
2 = Intense form of symptom (exhaustion) present more than 50% of the past month.

☐ (16)

** Have you had difficulty in relaxing during the past month? (Do your muscles feel tensed up?)

RATE MUSCULAR TENSION: Do not include a subjective feeling of nervous tension, which is rated later.

1 = Symptom definitely present during past month, but of moderate clinical intensity, or intense less than 50% of the time.
2 = Symptom clinically intense more than 50% of past month.

☐ (17)

** Have you been so fidgety and restless that you couldn't sit still?

RATE RESTLESSNESS: (Do you have to keep pacing up and down?)

1 = Only moderate form of symptom (fidgety, restless) present; or intense form (pacing, can't sit down) less than 50% of the time.
2 = Intense form of symptom (pacing, etc.) present more than 50% of past month.

☐ (18)

** Do you tend to worry over your physical health?

RATE HYPOCHONDRIASIS: Overconcern with possibility of death, disease or malfunction. (N.B.) Re-rate at end of interview if subject constantly reverts to hypochondriacal preoccupation. Consider ratings of symptoms (1) and (3).

1 = Symptom present during past month, but not (2).
2 = Subject constantly reverts to hypochondriacal preoccupations during interview. ☐ (19)

** Do you often feel on edge or keyed up or mentally tense or strained?

(Do you generally suffer with your nerves?)
(Do you suffer from nervous exhaustion?)

RATE SUBJECTIVE FEELING OF 'NERVOUS TENSION':
There is no need for autonomic accompaniments for this symptom to be rated present.

1 = Symptom definitely present during past month, but of moderate intensity, or intense less than 50% of the time. ☐ (20)
2 = Intense form of symptom present more than 50% of the past month.

3. AUTONOMIC ANXIETY

In this section, rate only subjective anxiety with autonomic accompaniments, either free-floating or situational. Do not include worrying or nervous tension.

** Have there been times lately when you have been very anxious or frightened? (What was this like?)

(Did your heart beat fast?)

Ask for other autonomic symptoms.

(How often in the past month?)

* CHECK LIST of accompaniments: must check each item.

Autonomic - 1. Blushing 2. Butterflies 3. Choking
4. Difficulty getting breath 5. Dizziness
6. Dry mouth 7. Giddiness 8 Palpitations
9. Sweating 10. Trembling

Other - 1. Difficulty falling asleep
2. Muscular tension
3. Persistent worries about future events
4. Fidgeting or inability to sit still

(52) ☐

no symptoms = 0
one or more = 1

RATE FREE-FLOATING AUTONOMIC ANXIETY: Exclude if purely situational.

1 = Symptoms definitely present, with autonomic accompaniment, (i.e. any of sym toms 1-10) during the past month, but of moderate clinical intensity, or intense less than 50% of the time. ☐ (21)
2 = Symptom clinically intense more than 50% of the time.

** Have you had the feeling that something terrible might happen? (That some disaster might occur but you are not sure what? Like illness or death or ruination?)

(Have you been anxious about getting up in the morning because you are afraid to face the day?) (What did it feel like?)

RATE ANXIOUS FOREBODING WITH AUTONOMIC ACCOMPANIMENTS. (First 10 symptoms)

1 = Symptom definitely present, with autonomic accompaniment, during past month, but of moderate clinical intensity, or intense less than 50% of the time. ☐ (22)
2 = Symptom clinically intense more than 50% of the time.

[9] (23)

CUT OFF IF SCORED 0 IN BOXES 20, 52, 21, 22.
PROCEED TO SECTION 4.

IF SCORE 1 or MORE IN ANY PROCEED BELOW

Cut off

PANIC DISORDER

- Have you had times when you felt shaky, or your heart pounded, or you felt sweaty, and you simply had to do something about it?
- Have you had any attacks of panic at all?

(What was it like?)
(What was happening at the time?)

If no attacks at all → Situational Autonomic Anxiety
If yes continue.

- During most of these attacks did you have: (Go through check list)

____ Shortness of breath
____ Palpitations
____ Chest pains or discomfort
____ Smothering or choking feelings
____ Dizziness or as if things spinning or unreal
____ Tingling
____ Faintness
____ Sweating
____ Trembling or shaking
____ Fear of dying or going crazy or losing control during the attack

(53) ☐ None or 1 = 0
2 symptoms = 1
3 symptoms or more = 2

- How many attacks of panic did you have leading to action like leaving a bus or 'phoning for help?

RATE PANIC ATTACKS WITH AUTONOMIC SYMPTOMS: AND LEADING TO ACTION

Rate here if panic or intolerable anxiety leads to some action to end it, e.g. leaving a bus, 'phoning husband at work, going in to see a neighbour etc.

1 = One to 4 panic attacks - leading to action - during month.
2 = Panic attacks - leading to action - 5 or more times. ☐ (24)

- Did you have any panic attacks not leading to any action? YES/NO
- How many of both kinds of panic attacks have you had in the last 4 weeks? ____
- For how many weeks did you have at least one attack a week? (Include both kinds of panic attacks.)

0 = less than 3 attacks in 3 weeks.
(54) ☐ 1 = 3 attacks in 3 weeks or more, but less than 6 attacks in 6 weeks.
2 = 6 attacks in 6 weeks or more.

(55) ☐ - Were you nervous or anxious much of the time between attacks? YES/NO

SITUATIONAL AUTONOMIC ANXIETY

- Do you tend to get anxious in certain situations such as travelling, or being alone, or being in alift or tube train? (What situations?) (How often during the past month?)

(CHECK LIST: Can be presented on separate card and each item rated separately, if needed.)

Crowds (shop, street, theatre, cinema, church).
Going out alone; being at home alone.
Enclosed spaces (hairdresser, 'phone booth, tunnel).
Open spaces, bridges.
Travelling (buses, cars, trains).

RATE SITUATIONAL AUTONOMIC ANXIETY

1 = Has not been in such situations during the past month but aware that anxiety would have been present if the situation had occurred.
2 = Situation has occurred during the past month and patient did feel anxious because of it. ☐ (25)

- What about meeting people, e.g. going into a crowded room, making conversation?

(CHECK LIST: Present card if necessary.)

Speaking to an audience.
Eating, drinking or writing in front of other people.
Parties.

RATE AUTONOMIC ANXIETY ON MEETING PEOPLE

1 = Has not been in such situations during the past month but aware that anxiety would have been present if the situation had occurred.
2 = Situation has occurred during the past month and patient did feel anxious because of it.

☐ (26)

- Do you have any special fears, like some people are scared of feathers or cats or spiders or birds?

(CHECK LIST: Present card if necessary.)

Heights, thunderstorms, darkness.
Animals or insects of any kind.
Dentists, injections, blood, injury.

RATE ONLY SPECIFIC PHOBIAS, NOT GENERAL SITUATIONAL ANXIETY

1 = Has not been in such situations during the past month but aware that anxiety would have been present if the situation had occurred.
2 = Situation has occurred during the past month and patient did feel anxious because of it.

☐ (27)

- Do you avoid any of these situations (specify as appropriate) because you know you will get anxious?

(How much does it affect your life?)

RATE AVOIDANCE OF ANXIETY-PROVOKING SITUATIONS

1 = Subject tends to avoid such situations whenever possible.
2 = Marked generalisation of avoidance has occurred during past month, e.g. subject has not dared to leave the house or has gone out only if accompanied.

☐ (28)

4. THINKING, CONCENTRATION ETC.

** Can you think clearly or is there any interference with your thoughts?

** Do your thoughts tend to be muddled or slow?
(Can you make up your mind about simple things quite easily?)
(Make decisions about everyday matters?)

RATE SUBJECTIVELY INEFFICIENT THINKING

1 = Symptom definitely present during the past month, but of moderate clinical intensity, or intense less than 50% of the time.
2 = Symptom clinically intense more than 50% of the past month.

☐ (29)

** What has your concentration been like recently?
(Can you read an article in the paper or watch a TV programme right through?)
(Do your thoughts drift off so that you don't take things in?)

RATE POOR CONCENTRATION

1 = Only moderate form of symptom present during the past month (e.g. can read a short article, can concentrate if tries hard); or intense less than 50% of the time.
2 = Symptom clinically intense (cannot attempt to read or concentrate) more than 50% of the past month.

☐ (30)

** Do you tend to brood on things?
(So much that you even neglect your work?)

RATE NEGLECT DUE TO BROODING

1 = Symptom has caused moderate impairment to work or social relationships.
2 = Marked impairment.

☐ (31)

** What about your interests, have they changed at all?
(Have you lost interest in work, or hobbies, or recreations?)
(Have you let your appearance go?)

RATE LOSS OF INTEREST continuing during the past month.

1 = Symptom definitely present during the past month, but of moderate clinical severity or severe loss less than 50% of the time.
2 = Symptom clinically severe more than 50% of the past month.

☐ (32)

5. DEPRESSED MOOD

** Do you keep reasonably cheerful or have you been very depressed or low-spirited recently?
Have you cried at all?
(When did you last really enjoy doing anything?)

RATE DEPRESSED MOOD. N.B. When rating clinical severity of depression remember that deeply depressed people may not necessarily cry. See definition in glossary.

1 = Only moderately depressed during past month, or deep depression for less than 50% of the time and tending to vary in intensity.
2 = Deeply depressed for more than 50% of the past month, and tending to be unvarying in intensity.

☐ (33)

(56) [9]

** How do you see the future?
(Has life seemed quite hopeless?)
(Can you see any future?)
(Have you given up or does there still seem some reason for trying?)

RATE HOPELESSNESS on subject's own view at present.

1 = Hopelessness of moderate intensity but still has some degree of hope for the future (irrespective of time during month).
2 = Intense form of symptom (patient has given up hope altogether).

[ ] (34)

USE JUDGEMENT ABOUT WORDING

THOUGHTS ABOUT DEATH OR SUICIDE

** When a person gets depressed he may think about dying or suicide. Have you?

(57) [ ] 1 = Frequent thoughts about death (would be better off dead) or thoughts of suicide without plans.

** Have you felt that life wasn't worth living?
(Did you ever feel like ending it all?)
(What did you think you might do?)
(Did you actually try?)

RATE SUICIDAL PLANS OR ACTS

1 = Deliberately considered suicide (not just a fleeting thought) but made no attempt.
2 = Suicidal attempt but subject's life never likely to be in serious danger, except unintentionally.
3 = Suicidal attempt apparently designed to end in death (i.e. accidental discovery or inefficient means).

[ ] (35)

N.B. Examiner should judge clinically whether there was intent to end life or not. If in doubt, assume not.

If boxes 33 or 34 or 35 have a 1 or a 2 continue. Cut off If not → Section

IF EVIDENCE OF BOTH DEPRESSION AND ANXIETY
RATE ANXIETY OR DEPRESSION PRIMARY

If subject suffers from both anxiety and depression and both have been rated as present, try to decide which is primary.

~ Which seems worse, the depression or the anxiety?
(Use patient's own terms.)

0 = Anxiety is primary. Depression appears to be entirely explicable in terms of the limitations placed on the subject by the symptoms of anxiety, e.g. being unable to leave the house, travel, meet people etc., or being afraid of heart disease because of palpitations.
1 = Anxiety and depression both present but seem independent of each other or it is not possible to decide whether one of them is primary.
2 = Depression is primary. Anxiety is either a result of the depression (e.g. subject is frightened because of morbid or suicidal ideas) or it takes the form of fears of catastrophe, forebodings about illness or death, dread of having to face the day when first waking in the morning, preoccupation that something awful is going to happen. Panic attacks and situational anxiety, if present, are secondary to depression.

☐ (36)

* Is the depression worse at any particular time of day?

RATE MORNING DEPRESSION (particularly on waking)

0 = No depression
1 = Not specifically marked in mornings
2 = Specifically marked in mornings

☐ (37)

6. SELF AND OTHERS

** Have you wanted to stay away from other people?
(Why?)
(Have you been suspicious of their intentions?
Of actual harm?)

RATE SOCIAL WITHDRAWAL

1 = Only passive form of symptom, i.e. subject does not seek company but does not refuse it if offered; or, if active withdrawal, less than 50% of the month.
2 = Actively avoids company (refuses it if offered). Actively withdraws in this way for more than 50% of the month.

☐ (38)

** What is your opinion of yourself compared to other people?
(Do you feel better, or not as good, or about the same as most?)
(Do you feel inferior or even worthless?)

RATE SELF-DEPRECIATION

1 = Some inferiority, not mounting to feeling of worthlessness. If subject considers self to be worthless, this intense form of the symptom is present less than 50% of the time.
2 = Subject considers self to be completely worthless. Symptom present more than 50% of the month. ☐ (39)

** How confident do you feel in yourself?:
(For example, in talking to others, or in managing your relations with other people?)

RATE LACK OF SELF-CONFIDENCE WITH OTHER PEOPLE

Consider only competence in social relationships, not competence at mechanical work, etc.

1 = Moderate lack of self-confidence, or intense lack less than 50% of the month.
2 = Intense lack of self-confidence more than 50% of the month. ☐ (40)

** Are you self-conscious in public?
(Do you get the feeling that other people are taking notice of you in the street or a bus or a restaurant?)
(Do they ever seem to laugh at you or talk about you critically?)
(Do you consider people really are looking at you, or is it perhaps the way you feel about it?)

RATE SIMPLE IDEAS OF REFERENCE

1 = Marked self-consciousness only (irrespective of time during month).
2 = Feels that people are criticising or laughing at self but can be reassured. ☐ (41)

** Do you have the feeling that you are being blamed for something, or even accused?
What about?

RATE GUILTY IDEAS OF REFERENCE. Do not include justifiable blame or accusation.

1 = Subject feels blamed but not accused (irrespective of time during month).
2 = Subject feels accused of some sin or misdemeanour. ☐ (42)

** Do you tend to blame yourself at all?
(If people are critical, do you think you deserve it?)

RATE PATHOLOGICAL GUILT ONLY

1 = Subject feels over-guilty about some peccadillo (irrespective of time during month).
2 = Subject feels to blame for everything that has gone wrong even when not her fault. ☐ (43)

7. APPETITE, SLEEP, RETARDATION, LIBIDO

** What has your appetite been like recently?
Are you eating less than usual?
(Do you have to force yourself to eat?)

POOR APPETITE

0 = Normal or increased
1 = Moderate decrease
2 = No appetite.

(58) ☐

** (Have you lost any weight during the past 3 months?)

RATE LOSS OF WEIGHT DUE TO POOR APPETITE
(Do not include changes due to physical illness.)

1 = Less than 7 lb (3.2 kg)
2 = 7 lb (3.2 kg) or more

☐ (44)

** Have you had an increase in appetite?

INCREASED APPETITE

0 = No increase or slight increase
1 = Mild to moderate increase
2 = Hungry all the time

(59) ☐

** Have you gained weight over the last 3 months?

WEIGHT GAIN

0 = No weight gain or only regained lost weight
1 = Doubtful or up to 5 lbs.
2 = 5 lbs.

(60) ☐

** Have you had trouble sleeping?
(How bad does it get?)

POOR SLEEP

0 = No difficulty or occasional difficulty
1 = Mild to moderate - often or usually has significant difficulty
2 = Severe; almost always has great difficulty

(61) ☐

** Are you sleeping longer or more than usual?

0 = Normal sleep or occasionally sleeps more than usual
1 = Frequently sleeps at least 1 hour more than usual
2 = Frequently sleeps 2-4 hours more than usual

(62) ☐

** Have you had any trouble getting off to sleep during the past month?
(How long do you lie awake?)
(What happens if you take a sleeping tablets?)
(How often does it happen?)

RATE DELAYED SLEEP

1 = One hour or more delay (irrespective of sleeping tablets)
2 = Two hours or more delay (irrespective of sleeping tablets) ☐ (45)

(In either case, ten or more nights during month)

** Do you seem to be slowed down in your movements, or to have too little energy recently?
How much has it affected you?
(Do things seem to be moving too fast for you?)

RATE SUBJECTIVE ANERGIA AND RETARDATION

1 = Marked subjective listlessness and lack of energy
2 = Marked retardation and underactivity (irrespective of time during month). ☐ (46)

IF NO APPETITE OR SLEEP DISTURBANCE, AND NO DEPRESSION, CUT OFF → SECTION 8

Cut off

IF SLEEP DISTURBANCE OR DEPRESSION:

- Do you wake early in the morning?

RATE EARLY WAKING (one hour before usual)

1 = One hour or more before ordinary time
2 = Two hours or more before ordinary time ☐ (47)

(In either case, ten or more nights during month.)

- Has there been any change in your interest in sex?

RATE LOSS OF LIBIDO WITHIN PRESENT EPISODE OF ILLNESS AND PERSISTING DURING PAST MONTH

1 = Marked loss of interest and performance
2 = Almost total loss of libido ☐ (48)

- Does the depression or tension get worse just before the start of the monthly period?

RATE PREMENSTRUAL EXACERBATION

0 = No definite exacerbation
1 = Marked exacerbation ☐ (49)

8. IRRITABILITY

** Have you been very much more irritable than usual recently?
(How do you show it?)
(Do you keep it to yourself, or shout, or even hit people?)

RATE IRRITABILITY

1 = Keeps irritation to herself
2 = Shows anger by shouting or quarrelling
3 = Shows anger by hitting people, throwing or breaking things ☐ (50)

9. OBSESSIONS

These symptoms are usually experienced as occurring against conscious resistance (see definition in glossary)

** Do you find that you have to keep on checking things that you know you have already done?
(Like gas taps, doors, switches, etc.)
(Do you have to touch or count things many times or repeat the same action over and over again?)
(What happens when you try to stop?)

RATE OBSESSIONAL CHECKING AND REPEATING. ☐

1= Symptom of moderate intensity or, if sever, present less than 50% of the time
2= Symptom present in severe degree, more than 50% of the past month.

** Do you spend a lot of time on person cleanliness, like washing over and over even though you know you are clean?
What about tidiness?
(Do you get worried by contamination with germs?)
(Do you have other rituals?)
(What happens when you try to stop?)

RATE OBSESSIONAL CLEANLINESS AND SIMILAR RITUALS. ☐

1= Symptom of moderate intensity or, if severe, present less than than 50% of the time.

2= Symptom present in severe degree, more than 50% of the past month.

** Do you find it difficult to make decisions even about trivial things?
(Do you constantly have to question the meaning of the universe?)
(Do you get awful thoughts coming into your mind even when you try to keep them out?)

RATE OBSESSIONAL IDEAS AND RUMINATION ☐

1= Symptom of moderate intensity or, if severe, present less than 50% of the time.

2= Symptom present in severe degree, more than 50% of the past month.

10 BEHAVIOUR, AFFECT AND SPEECH

RATINGS

0 = Symptom absent
1 = Present in fairly severe degree, or very severe but intermittent during interview
2 = Present in very severe degree and almost continuous during interview
8 = Examiner not sure
9 = Subject not examined, or examination not appropriate

N.B. If in doubt, rate (0). A rating of (1) means there is no doubt about the symptom being present in a fairly severe form.

Behaviour during interview

(63) ☐ ** Self-neglect (cleanliness, make-up, state of hair and clothes)

(64) ☐ ** Slowness and underactivity (sit abnormally still, walks abnormally slowly, delay in performing movements)

(65) ☐ ** Agitation (fidgety, restlessness, pacing, frequent unnecessary movements)

Affect during interview

(66) ☐ ** Observed anxiety (tense, worried look or posture, fearful apprehensive look, frightened tone of voice, tremor)

(67) ☐ ** Observed depression (sad, mournful look, tears, gloomy tone of voice, deep sighing, voice chokes on distressing topic)

Speech during interview

(68) ☐ ** Slow speech (long pauses before answering, long pauses between words)

Self pity

** Behaviour and remarks indicate self-indulgent focusing on her own sorrows, problems or misfortunes. In judging the severity, note the extent to which she demonstrates the following:

(1) Suffering is directly communicated without restraint in order to elicit sympathy from others.
(2) Personal problems are viewed as unique or more severe than those suffered by others; and
(3) Feels that she is not being helped or understood by others.

(69) ☐
0 = Not present
1 = Mild to moderate
2 = Severe to extreme

Demandingness or Dependency

** Has sought undue assistance, praise or reassurance frequently from others, e.g. asks for advice or opinions of others, repeatedly asks staff to help her.

(70) ☐
0 = Not present
1 = Mild to moderate
2 = Severe to extreme

[redacted]. KEY SYMPTOMS

20 21 22	32	33	53 54
Anxiety	Loss of interest	Depression	Panic attacks

** You've told me about ..... (see standard dating procedure schedule)

RECORD ALL RELEVANT DETAILS BELOW

(71) ☐☐ WEEKS AGO OF ONSET

DURATION OF SYMPTOMS

(73) ☐
0 = No illness or less than 1 week
1 = 1 week or more, but less than 2 weeks
2 = 2 weeks or more

** When did you last feel like your normal self for two months or more?

(74) ☐
1 = Less than 2 years ago
2 = 2 years or more than 2 years ago
3 = Always like this

11. IMPAIRMENT OF FUNCTIONING

If depression or panic or anxiety present:

** During this time when you have been depressed (or panicky or anxious)
did you seek help from someone? YES/NO
did anyone suggest you seek help? YES/NO
did you take any medication? YES/NO
did you act differently with people, family or at work? YES/NO

(75) ☐
If yes to one of the above, score 1 in box.
If no to all, score 0.

12 DELUSIONS AND HALLUCINATIONS

** Now I should like you to answer some questions which we ask of everybody:-

Has your imagination been playing tricks on you in any way?

Do you ever seem to hear noises or voices when there is no-one about, and nothing else to explain it?

Is that true of visions or other unusual experiences which some people have?

(76) ☐ No = 0
Yes to any of these questions = 1

If YES describe in detail subject's experience in her own words.

(77) ☐

(78) ☐

(79) ☐☐ WEEKS AGO OF OFFSET IF IN ONE MONTH PERIOD

1 ☐☐☐ Code No.

4 ☐8 Card No.

** So far, I've been asking about difficulties you may have had in the last month. (That is, from the _____ until today.)

** Now, I want you to tell me whether you have had similar difficulties in the 5 months before that.
(That is, from the _____ until _____.)

13. DEPRESSIVE DISORDER

** Were you during those 5 months bothered by feeling depressed, sad, blue, hopeless, down in the dumps, or that you didn't care any more, or didn't enjoy anything? YES/NO

5 ☐

If no → PANIC DISORDER

Cut off

If yes, did you have a period of at least one week when you were feeling depressed (low etc. - use patient's own words) most of the time?

How long did it last?
No or less than 1 week = 0
1 week to 2 weeks = 1
More than 2 weeks = 2

6 ☐

Now ask probing questions and establish as near as possible date of onset and offset using five month dating procedure and PAS time line.

7 ☐☐ Record in boxes 7 and 8 weeks ago onset and in boxes 9 and 10 weeks ago of offset

9 ☐☐

Date of onset D M Y ☐☐ ☐☐ ☐☐

Date of offset D M Y ☐☐ ☐☐ ☐☐

If the symptoms lasted less than one week in the five month period → PANIC DISORDER

Cut off

- During that time:
  1. Did you seek help from someone? YES/NO
  2. Did anyone suggest you seek help? YES/NO
  3. Did you take any medication? YES/NO
  4. Did you act differently with people, family or at work? YES/NO

11 ☐ If yes to one of the above score 1 in box.
If no to all score 0.

- During the most severe period were you also bothered by:

12 ☐ (1) Poor appetite or weight loss or increased appetite or weight gain?

13 ☐ (2) Trouble sleeping or sleeping too much?

14 ☐ (3) Having too little energy, or getting tired or fatigued easily?

15 ☐ (4) Loss of interest or pleasure in your usual activities or sex?

16 ☐ (5) Feeling guilty, worthless or down on yourself?

17 ☐ (6) Trouble concentrating, thinking or making decisions?

18 ☐ (7) Thinking about death or suicide?

19 ☐ (8) Unable to sit still and having to keep moving or feeling slowed down or having trouble moving?

20 ☐ Enter total number of positive symptoms (1-8) in box 20.

If 4 or more → PANIC DISORDER
If less than 4, continue.

Cut off

21 ☐ (9) Crying?

22 ☐ (10) Thinking about things with no hope or pessimistic outlook?

23 ☐ (11) Brooding about unpleasant things that had happened?

24 ☐ (12) Worrying about feeling inadequate?

25 ☐ (13) Feeling resentful, irritable or angry?

26 ☐ (14) Needing reassurance or help from somebody?

27 ☐ (15) Feeling sorry for yourself?

28 ☐ (16) Physical problems that did not seem to be caused by any particular illness.

29 ☐ Enter total number of positive symptoms (from 1-16) in box 29.

30 [9]

14. PANIC DISORDER

** In the period of 5 months (until _____) have you had panic or anxiety attacks? Did you feel very frightened and have physical symptoms like:-

(1) Shortness of breath
(2) Palpitations
(3) Chest pain or discomfort
(4) Choking or smothering feelings
(5) Dizziness or as if the world were spinning or as if things were unreal
(6) Tingling
(7) Sweating
(8) Faintness
(9) Trembling or shaking
(10) Fear of dying, going mad or losing control

If the subject had discrete periods of apprehension or fearfulness with at least two of the above symptoms during such attacks, rate yes. (Do not include if lasts most of day or of limited to a circumscribed phobia stimulus, e.g. sees dog.)

31 ☐ 1 = Yes
0 = No

If no → GENERAL ANXIETY DISORDER

Cut off

- How many panic attacks did you have over the five months?

If 3 or more:

- For how many weeks altogether did you have at least one attack each week (specify number)?

32 ☐ 1 = 3 or more
0 = Less than 3

If less than 3 → GENERAL ANXIETY DISORDER

Cut off

** If more than 3, ask probing questions and establish as near as possible dates of onset and offset.

33 ☐☐ Record weeks ago of onset in boxes 32 and 33
35 ☐☐ and weeks ago of offset in boxes 34 and 35.

Date of onset D M Y ☐☐ ☐☐ ☐☐☐☐

Date of offset D M Y ☐☐ ☐☐ ☐☐☐☐

If yes:

37 ☐ - Were you nervous or anxious much of the time between attacks? YES/NO

If no → GENERAL ANXIETY DISORDER

Cut off

If yes:

- (1) Did the panic attacks affect your functioning in any way - socially, your family, at work? YES/NO

(2) Did you seek help from anyone like a doctor, a minister, or even a friend? YES/NO

(3) Did anybody suggest that you seek help? YES/NO

(4) Did you take any medication to help you with these panic attacks? YES/NO

(5) Did you drink excessively (alcohol) or abuse drugs as a result of these panic attacks? YES/NO

38 ☐ If yes to any above 5 questions 1 in box
If no to all 0 in box

15. GENERALIZED ANXIETY DISORDER

** In the period of 5 months (from _____ until _____) have you felt anxious, nervous, jittery, tense, restless or "uptight"?

39 ☐ YES/NO

If no → LAST ** QUESTION

Cut off

If yes,

- Have you had periods of at least 2 weeks when you felt anxious or tense most of the time? 40 ☐ YES/NO

If yes, ask probing questions and establish as near as possible dates of onset and offset.

41 ☐☐ Record weeks ago of onset in boxes 41 and 42 — Date of onset: D ☐ M ☐ Y ☐

43 ☐☐ and weeks ago of offset in boxes 43 and 44 — Date of offset: D ☐ M ☐ Y ☐

If lasting for less than two weeks in the 5 month period → LAST ** QUESTION

Cut off

- During the most severe period were you bothered by:
  - Difficulty falling asleep 45 ☐ YES/NO
  - Sweating or blushing or dizziness or palpitations or shortness of breath? 46 ☐ YES/NO
  - Muscles feeling tight or tremors? 47 ☐ YES/NO
  - Worrying much of the time about things that might happen? 48 ☐ YES/NO
  - Fidgeting or unable to sit still? 49 ☐ YES/NO

If yes to any one above 1 in box
If no to all 0 in box 50 ☐

If no → LAST ** QUESTION

Cut off

If yes:

- (1) Did this anxiety (use patient's own words) affect your functioning in any way; socially, your family or at work? YES/NO
  (2) Did you seek help from anyone like a doctor, a minister or even a friend? YES/NO
  (3) Did anybody suggest that you seek help? YES/NO
  (4) Did you take any medication to help you with these anxiety symptoms? YES/NO

If yes to any above 1 in box
If no to all 0 in box 51 ☐

MOOD CHANGES IN THE PAST

** Now I would like to ask you some questions about your past. I would like to know how you have been in your mood in the past, apart from during the last six months.

16. CYCLOTHYMIC PERSONALITY

** Since you have been an adult have you been the kind of person who often has a few days when you feel down or depressed and then has a few days when you feel even better than normal or high? YES/NO

52 ☐

If no → BRIQUET'S DISORDER — Cut off

- When you were 'high' or clearly 'better than normal', did you have the following during the most severe period?

1. More active than usual - either socially, at work, sexually or physically restless. YES/NO

53 ☐

2. More talkative than usual or felt a pressure to keep on talking. YES/NO

54 ☐

3. Racing thoughts or talking so fast that it was difficult for people to follow what you were saying. YES/NO

55 ☐

4. Feeling that you were a very important person, had special plans, powers, talents or abilities (grandiosity). YES/NO

56 ☐

5. Needing less sleep than usual. YES/NO

57 ☐

6. Trouble concentrating on what was going on because your attention kept jumping to unimportant things around you (distractibility). YES/NO

58 ☐

7. Doing foolish things that could have got you into trouble - like buying things, business investments, sexual indiscretions, reckless driving. YES/NO

59 ☐

If yes to 2 or more of questions 1-7 put 1 in box 60, otherwise put 0.

60 ☐

If 1 in box 60, continue.

If no → BRIQUET'S DISORDER — Cut off

If yes:

- Does that mean much of the time you are either 'up or down'? (Mood changes too numerous to count.) YES/NO

61 ☐

If no → BRIQUET'S DISORDER — Cut off

If yes:

- Does your mood often change for no apparent reason? (Are your mood changes unrelated to external events or circumstances?) YES/NO

If yes, score 1 in box
If no, score 0 in box

62 ☐

17. BRIQUET'S DISORDER

** What has your physical health been like?

** Has your physical health been poor most of your life?
Have you had many illnesses?
What about operations?

(Score YES if you consider that the subject has a vague and dramatic medical history, starting prior to age 25.) YES/NO

63 ☐ If unsure, continue.

If no → INTERMITTENT DEPRESSIVE DISORDER — Cut off

If yes, continue:

Notes: For the questions in this section you can rate YES without confirmatory evidence that the symptom was actually present. The mere report of such by the subject is sufficient. However, only physical symptoms, that in your judgement are not explained by some physical illness, are considered significant. This judgement often will require asking additional questions about the presence of other symptoms, what treatment was given, what the doctor said was wrong, etc.

64 ☐ - 1. Would you say you have been sickly a good part of your life? YES/NO

2. Have you ever had loss of sensation or not been able to feel something (whether or not associated with numbness), or lost your voice and been unable to even whisper (but not just hoarseness), or trouble walking or paralysis - inability to move (not due to pain or numbness), or blindness (complete absence of light perception lasting more than an instant), or convulsions, fits, seizures, or falling-out spells, or periods of unconsciousness when you couldn't remember what happened to you or what you had done (not associated with alcohol or drugs)?

65 ☐ YES to any/ No to all

66 ☐ 3. Have you ever had abdominal pain or vomiting spells? YES/NO

4. Have you often been so bothered by menstrual pain that you could hardly do your (work, housekeeping, care of children, leisure time activities)?

Have you ever missed more than 2 periods in a row for more than a few times (excluding pregnancy or first year after menarche or menopause)?

67 ☐ Have you ever been bothered by excessive bleeding? YES to any/ No to all

5. Have you usually been uninterested in sex, or been unable to enjoy sexual relations (with or without orgasm), or found intercourse painful? (For major portion of life after

68 ☐ opportunities for a sex life?) YES/NO

69 ☐ 6. Have you been bothered by back pain, joint pain, pain in your arms or legs, or more headaches than most people? YES/NO

If yes to 5 of the groups, continue (i.e. score of 1 in boxes 64-69)

Otherwise → INTERMITTENT DEPRESSIVE DISORDER — Cut off

If yes:

Using your judgement, do you (the rater) think that the subject has had a dramatic, vague or complicated medical history with onset prior to age 25?

70 ☐ If yes, score 1 in box
If no, score 0 in box

If yes to Cyclothymic (1 in box 62) → STOP → last ** question
If yes to Briquet's (1 in box 70) → STOP
If not → CONTINUE

1-3 ☐☐☐ Code No.
4 [9] Card No.

18. INTERMITTENT DEPRESSIVE DISORDER

5 ☐ ** For the past 2 years, have you been bothered by feeling depressed much of the time? YES/NO

If no → LABILE PERSONALITY — Cut off

If yes:

6 ☐ - During this time, when you have been depressed much of the time, have you often had periods when you felt alright, or even good, for a few hours, days or weeks at a time? YES/NO

If no → LABILE PERSONALITY — Cut off

If yes:

- When you were feeling depressed were you also bothered by:

7 ☐ 1. Poor appetite or weight loss or increased appetite or weight gain? YES/NO
8 ☐ 2. Trouble sleeping or sleeping too much? YES/NO
9 ☐ 3. Having too little energy or getting tired or fatigued easily? YES/NO
10 ☐ 4. Loss of interest or pleasure in your usual activities or sex? YES/NO
11 ☐ 5. Feeling guilty or worthless or down on yourself? YES/NO
12 ☐ 6. Trouble concentrating, thinking or making decisions? YES/NO
13 ☐ 7. Thinking about death or suicide? YES/NO
14 ☐ 8. Unable to sit still and having to keep moving or feeling slowed down and having trouble moving? YES/NO

15 ☐ 9. Crying? YES/NO

16 ☐ 10. Thinking about things with no hope or a pessimistic outlook? YES/NO

17 ☐ 11. Brooding about unpleasant things that had happened? YES/NO

18 ☐ 12. Worrying about feeling inadequate?

19 ☐ 13. Feeling resentful, irritable or angry? YES/NO

20 ☐ 14. Needing reassurance or help from somebody? YES/NO

21 ☐ 15. Feeling sorry for yourself? YES/NO

22 ☐ 16. Physical problems that did not seem to be caused by any particular physical illness? YES/NO

If yes to at least 2 symptoms (of 1-16) continue.

If not → LABILE PERSONALITY Cut off

If yes:

- 1. Did you seek help from anyone like a doctor, or a minister or even a friend? YES/NO
2. Or did anyone suggest you seek help? YES/NO
3. Or did you take any medication? YES/NO
4. Did you act differently with people, your family, or at work? YES/NO

23 ☐ If yes to any, score 1 in box - STOP → last ** question

If no to all, score 0 in box → LABILE PERSONALITY Cut off

19. LABILE PERSONALITY

** Now I want to know whether, for most of your life, you have been the kind of person whose mood <u>often</u> changed <u>quickly</u> from normal to bad, such as feeling depressed or angry, for a few hours or days and then returns to normal? (Not due to pre-menstrual tension.)

24 ☐ YES/NO

If no STOP. → last ** question If yes CONTINUE. Cut off

If yes:

- Would you say that you often:

25 ☐ 1. Are easily disappointed, feel sorry for yourself, or that you have been short-changed? YES/NO

26 ☐ 2. Over-react to difficult situations? YES/NO

27 ☐ 3. Make important decisions without thinking them over enough? YES/NO

28 ☐ 4. Are bothered by feeling inadequate? YES/NO

29 ☐ 5. Have difficulties getting along with people you are close to (such as breaking up, having arguments)? YES/NO

30 ☐ 6. Are preoccupied with the bad aspects of your life or situation? YES/NO

If yes to at least 3 continue

If not - STOP → last ** question — Cut off

If yes:

1. Has this interfered with your social life, work or ability to get things done? YES/NO

2. Have you taken medication because of it? YES/NO

3. Did you ever seek help from someone because of it? (Were you ever referred for help?) YES/NO

If yes to any, score 1 in box
If no to all, score 0 in box

31 ☐

** So far we have been discussing the kinds of problem you may have had with your nerves.

HAVE YOU DURING THE LAST 6 MONTHS:-

..... been to your G.P. about your nerves?

Yes = 1
No = 0

32 ☐

(If YES determine total number of consultations made during 6 months for nervous problems, the number of weeks ago first consultation in 6 months made and the number of weeks ago most recent consultation for nerves. USE PAS TIME LINE TO AID DATING)

33 ☐☐ Total number

35 ☐☐ Weeks ago first consultation

37 ☐☐ Weeks ago last consultation

..... attended a hospital as a psychiatric outpatient?

Yes = 1
No = 0

39 ☐

(If YES repeat procedure as for G.P. consultations)

40 ☐☐ Total number

42 ☐☐ Weeks ago first consultation

44 ☐☐ Weeks ago last consultation

..... been an inpatient in a psychiatric hospital?

Yes = 1
No = 0

46 ☐

(If YES determine duration in weeks of stay, weeks ago of admission and weeks ago of discharge)

(First Admission)

47 ☐☐ Duration

49 ☐☐ Weeks ago admitted

51 ☐☐ Weeks ago discharged

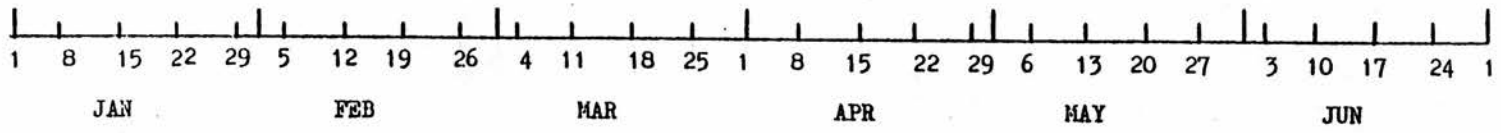
(Second Admission)

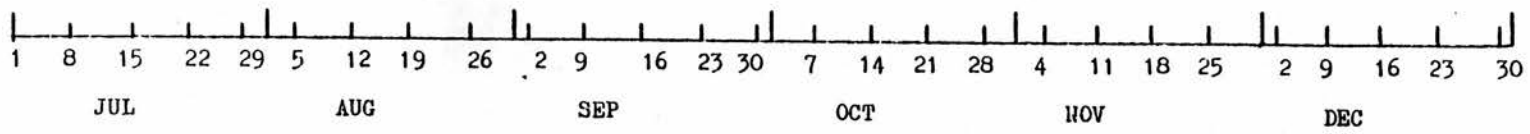
53 ☐☐ Duration

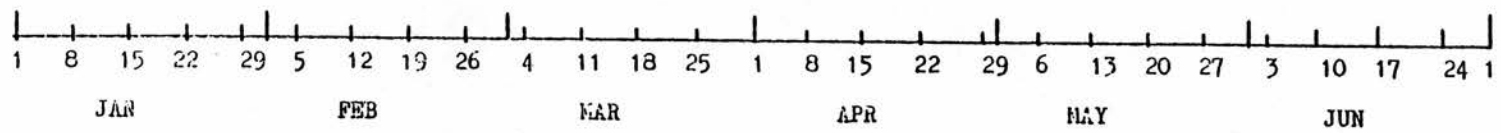
55 ☐☐ Weeks ago admitted

57 ☐☐ Weeks ago discharged

PAS TIME LINE







APPENDIX V THE LIFE EVENTS AND DIFFICULTIES SCHEDULE (LEDS)

LIFE EVENTS

** "Here is a list of things that can happen to people. I want you to place a tick in front of any of these things that have happened to you or to people close to you, in the past six months - that is back to (DATE). By people close to you, I mean:

(SPELL OUT ALL THE LIVING PEOPLE THAT ARE RELEVANT. THESE ARE PARENTS, SIBLINGS, HUSBAND (WHETHER OR NOT SEPARATED), FIANCE, CHILDREN, STEP PARENTS, STEP SIBLINGS, STEP CHILDREN, HALF SIBLINGS, ADOPTED CHILDREN, CONFIDANTS NOT OTHERWISE COVERED.)

"You may find that something that has happened falls into more than one category. If so, tick it each time it occurs. This is just to start us off. When you have finished I will be asking you about these things in more detail."

WHEN S REACHES THE END OF THE EVENTS SECTION SAY:

** "Now this is a list of aspects of life in which you may have been experiencing difficulty during the past six months. Once again, place a tick in front of any of these which have happened to you or to the people close to you."

NOW WORK THROUGH EACH INCIDENT TICKED COVERING THE FOLLOWING POINTS:

1. DETERMINE WHETHER IT IS AN EVENT OR A NON-EVENT (DIFFICULTY OR NON-DIFFICULTY).
2. GET THE DATE(S) AND RECORD ON THE TIME LINE.
3. GET THE FULL STORY AND ALL THE FACTS, QUESTIONING AS NON-DIRECTIVELY AS POSSIBLE. GET AS MUCH DOWN ON PAPER AS POSSIBLE.
4. PROBE SYSTEMATICALLY TO GET ENOUGH INFORMATION TO MAKE ALL THE RATINGS ABOUT THE INCIDENT.
5. MAKE SURE THE TICK REPRESENTS ONLY ONE INCIDENT. (e.g. "and was that the only illness that has happened during the past six months?")
6. SHOULD THERE BE A HOUSING DIFFICULTY FILL IN THE HOUSING SHEET.
7. SHOULD THERE BE AN INTERACTION CHANGE FILL IN THE NETWORK CHANGES SHEET.
8. IF NO TICKS ON EVENTS SHEET TRY TO GET A LEAD FROM THE PAS.

NOW WORK THROUGH THE FOLLOWING QUESTIONS, ASKING EACH ONE THAT IS RELEVANT, UNLESS YOU HAVE ALREADY HAD A POSITIVE RESPONSE. BE ON THE LOOK OUT FOR FURTHER EVENTS. RECORD AND PROBE THEM IF AND WHEN THEY OCCUR.

** "Are there any relatives you worry about for any reason - because of a health problem or a drinking or gambling problem, or drugs?"

** "Have you made any special new friends?"

** IF OVER 38:

"What about the change of life? Have you had any problems with that?"

** FOR THOSE NOT LIVING WITH A HUSBAND:

"Have you had a boy friend?"

IF YES:

"Have you thought of marrying him?"

IF NO:

"Have you ever had one in the past?" "Have you missed not having one?"

** FOR THOSE LIVING WITH A HUSBAND:

"Have you had any broken friendships or attachments in the last six months?"

"Have you and your husband both been living at home during this time?"

IF NO:

"Have you been separated for any length of time during the past six months?"

"Have either of you ever considered a permanent separation or divorce?"

** "In the last six months has there been any big change in the amount you have been seeing of your friends and close relatives?"

** "Has anybody moved away in the last six months?"

** "Have you had a row with anyone or lost a good friend?"

** "Have you been seeing any more of your friends or close relatives recently?"

LIFE EVENTS - DEATHS AND NETWORK CHANGES

Code No. ☐☐☐ (1 2 3) Card ☐ (C) (4)

Reduced contact

Friends and Close Relatives who Left or Died

Name of Person	Confidant Status	Permanent/ Temporary	Weeks ago exited	How often seen prior to exit	How often seen after exit	Telephone contacts	Letter contacts
_____	☐ 5	☐ 6	☐☐ (7 8)	☐ 9	☐ 10	☐ 11	☐ 12
_____	☐ 13	☐ 14	☐☐ (15 16)	☐ 17	☐ 18	☐ 19	☐ 20
_____	☐ 21	☐ 22	☐☐ (23 24)	☐ 25	☐ 26	☐ 27	☐ 28
_____	☐ 29	☐ 30	☐☐ (31 32)	☐ 33	☐ 34	☐ 35	☐ 36

Increased contact

Friends and Close Relatives who Entered

Name of Person	Confidant Status	Permanent/ Temporary	Weeks ago entered	How often seen prior to entrance	How often seen after entrance	Telephone contacts	Letter contacts
_____	☐ 37	☐ 38	☐☐ (39 40)	☐ 41	☐ 42	☐ 43	☐ 44
_____	☐ 45	☐ 46	☐☐ (47 48)	☐ 49	☐ 50	☐ 51	☐ 52
_____	☐ 53	☐ 54	☐☐ (55 56)	☐ 57	☐ 58	☐ 59	☐ 60
_____	☐ 61	☐ 62	☐☐ (63 64)	☐ 65	☐ 66	☐ 67	☐ 68

Codes:-

Is/was a Confidant = 1

Is/was not a Confidant = 2

Permanent (I.e. > 3 months) = 1

Temporary (I.e. ≤ 3 months) = 2

1 = None
2 = Less than 1/week
3 = 1/week
4 = More than 1/week but less than daily
5 = Daily
6 = Person died (record in all four columns)

EVENTS

REMEMBER. INCLUDE THINGS THAT HAVE HAPPENED EITHER TO YOU PERSONALLY OR TO THE PEOPLE CLOSE TO YOU.

___ Loss of job or change of job

___ Time off work because of illness

___ Return to work after period away from it

___ Trouble at work (e.g. arguments with bosses or workmates; strikes)

___ Promotion or change of responsibilities at work

___ Pregnancy

___ Birth

___ Starting or leaving school or university; starting a new course

___ Engagement (including also decision to get engaged as well as the formal or informal announcement)

___ Marriage (ceremony; setting the date of a wedding)

___ Divorce

___ Separation (including temporary separation)

___ Retirement

___ Illness (including nervous illness)

___ Admission to hospital

___ Discharge from hospital

___ Death (including also the deaths of friends and more distant relatives)

___ Miscarriage

___ Surgical operation

___ Contact with the police or the courts

___ Accidents (including witnessing an accident or being involved in the consequences of an accident)

___ Burglaries (only burglaries of <u>your</u> property)

___ Loss, damage or theft of <u>your</u> property

___ Examinations (including also hearing the results)

___ Crises or emergencies (e.g. emergencies involving the children, money, housing or marriage)

___ Receiving news (e.g. getting bad or surprising news about something or somebody)

___ Satisfactions and disappointments (including anything which has upset you or made you happy, e.g. substantial increase in income)

___ Making important decisions (e.g. buying a house, giving up work, etc.)

DIFFICULTIES

REMEMBER. INCLUDE DIFFICULTIES EXPERIENCED BOTH BY YOU PERSONALLY AND BY THE PEOPLE CLOSE TO YOU.

___ Family relationships (e.g. family rows; problems with relatives)

___ Housing (e.g. problems with state of repair or decoration of house; size, privacy; problems with landlord, neighbours)

___ Work (e.g. lack of employment; insecurity of job; poor work conditions; problems getting on with workmates; difficult hours)

___ Money (e.g. problems with hire-purchase repayments; gambling; paying the rent or mortgage)

___ Health (including nervous illness, mental or physical handicaps, drugs, drinking problems, problems associated with the change of life, worries about aged relatives)

___ Children (including problems in looking after them, problems with schooling, behaviour, discipline and trouble with the police)

___ Personal relationships (including problems associated with sex; problems concerning getting on with friends, neighbours)

___ Has anything else happened to you during this period which has not been covered in this list?

Prior Warning
Forecast event? Prior decision? Prior event which caused this?

Anti Social Act
Police children's panel, courts involved?

Promise
Any good expected from this?

Focus
Who is the main actor?

Interaction Change
Is all the information on the sheet covered?

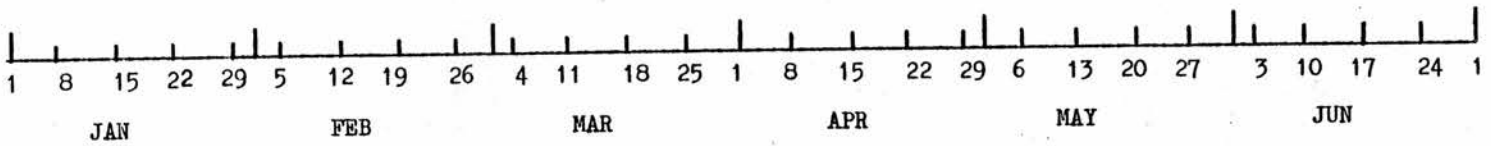
Uncertainty
Anything important about to happen? Is the outcome known? Anything which might happen but is not certain to?

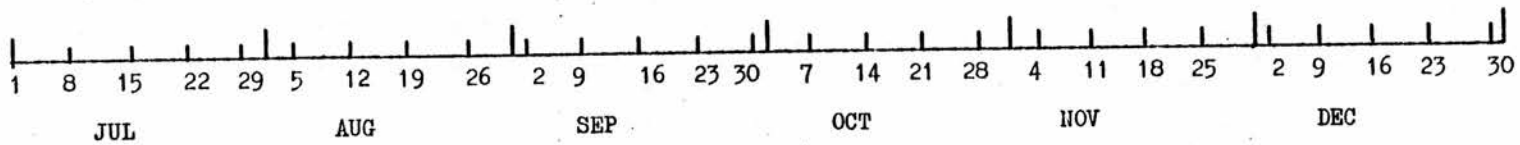
Conflict
Did S ever wonder what to do? Had she a choice?

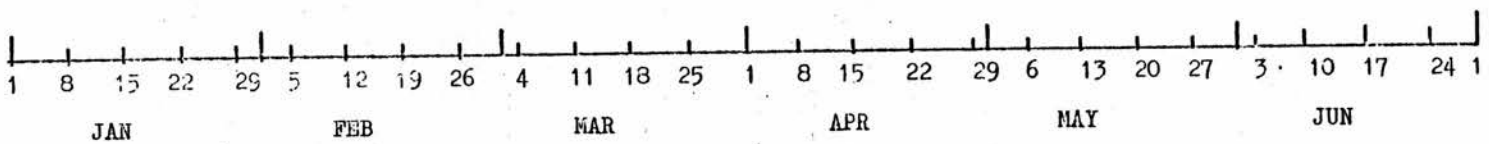
Coping
What did S do about this?

Tag
Are there other incidents stemming from or connected to this one?

LIFE EVENTS TIME LINE (Leap year version)







Card

Code number [ ][ ][ ][1][0] (1 2 3 4 5)

EVENTS

date — independence (A_1 B_2 C_3 D_4 E_5 F_6 G_7 H_8) — A — NP — F — interaction change (I_1 I_2 I_3 I_4 I_5) — U — C — ST — LT — CO — H — T

[ ][ ][8][8] (6 7 8 9) [ ][ ][ ][ ][ ][ ][ ][ ] (10 11 12 13 14 15 16 17) [ ] (18) [ ] (19) [ ] (20) [ ][ ][ ][ ][ ][ ] (21 22 23 24 25 26) [ ] (27) [ ] (28) [ ] (29) [ ] (30) [ ] (31) [ ] (32) [ ] (33)

[ ][ ][8][8] (34 35 36 37) [ ][ ][ ][ ][ ][ ][ ][ ] (38 39 40 41 42 43 44 45) [ ] (46) [ ] (47) [ ] (48) [ ][ ][ ][ ][ ][ ] (49 50 51 52 53 54) [ ] (55) [ ] (56) [ ] (57) [ ] (58) [ ] (59) [ ] (60) [ ] (61)

Interviewer number [ ][ ] (62 63)

Code number [ ][ ][ ][1][1] (1 2 3 4 5)

[ ][ ][8][8] (6 7 8 9) [ ][ ][ ][ ][ ][ ][ ][ ] (10 11 12 13 14 15 16 17) [ ] (18) [ ] (19) [ ] (20) [ ][ ][ ][ ][ ][ ] (21 22 23 24 25 26) [ ] (27) [ ] (28) [ ] (29) [ ] (30) [ ] (31) [ ] (32) [ ] (33)

[ ][ ][8][8] (34 35 36 37) [ ][ ][ ][ ][ ][ ][ ][ ] (38 39 40 41 42 43 44 45) [ ] (46) [ ] (47) [ ] (48) [ ][ ][ ][ ][ ][ ] (49 50 51 52 53 54) [ ] (55) [ ] (56) [ ] (57) [ ] (58) [ ] (59) [ ] (60) [ ] (61)

Code number [ ][ ][ ][1][2] (1 2 3 4 5)

[ ][ ][8][8] (6 7 8 9) [ ][ ][ ][ ][ ][ ][ ][ ] (10 11 12 13 14 15 16 17) [ ] (18) [ ] (19) [ ] (20) [ ][ ][ ][ ][ ][ ] (21 22 23 24 25 26) [ ] (27) [ ] (28) [ ] (29) [ ] (30) [ ] (31) [ ] (32) [ ] (33)

[ ][ ][8][8] (34 35 36 37) [ ][ ][ ][ ][ ][ ][ ][ ] (38 39 40 41 42 43 44 45) [ ] (46) [ ] (47) [ ] (48) [ ][ ][ ][ ][ ][ ] (49 50 51 52 53 54) [ ] (55) [ ] (56) [ ] (57) [ ] (58) [ ] (59) [ ] (60) [ ] (61)

Code number [ ][ ][ ][1][3] (1 2 3 4 5)

[ ][ ][8][8] (6 7 8 9) [ ][ ][ ][ ][ ][ ][ ][ ] (10 11 12 13 14 15 16 17) [ ] (18) [ ] (19) [ ] (20) [ ][ ][ ][ ][ ][ ] (21 22 23 24 25 26) [ ] (27) [ ] (28) [ ] (29) [ ] (30) [ ] (31) [ ] (32) [ ] (33)

[ ][ ][8][8] (34 35 36 37) [ ][ ][ ][ ][ ][ ][ ][ ] (38 39 40 41 42 43 44 45) [ ] (46) [ ] (47) [ ] (48) [ ][ ][ ][ ][ ][ ] (49 50 51 52 53 54) [ ] (55) [ ] (56) [ ] (57) [ ] (58) [ ] (59) [ ] (60) [ ] (61)

A = anti-social act NP = no promise F = focus U = uncertainty C = conflict ST = short-term threat

LT = long-term threat CO = coping H = health T = tag

Card

Code number [ ][ ][ ][1][4] (1 2 3 4 5)

DIFFICULTIES

date — start (6 7 8 9) end (34 35 36 37)

independence — A_1 (10) B_2 (11) C_3 (12) D_4 (13) E_5 (14) F_6 (15) G_7 (16) H_8 (17) (38 39 40 41 42 43 44 45)

A	NP	F	interaction change I_1	I_2	I_3	I_4	I_5	U	C	OS	GS	CO	H	T
18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61

Interviewer number [ ][ ] (62 63)

Code number [ ][ ][ ][1][5] (1 2 3 4 5)

6 7 8 9	10 11 12 13 14 15 16 17	18	19	20	21 22 23 24 25 26	27	28	29	30	31	32	33
34 35 36 37	38 39 40 41 42 43 44 45	46	47	48	49 50 51 52 53 54	55	56	57	58	59	60	61

Code number [ ][ ][ ][1][6] (1 2 3 4 5)

6 7 8 9	10 11 12 13 14 15 16 17	18	19	20	21 22 23 24 25 26	27	28	29	30	31	32	33
34 35 36 37	38 39 40 41 42 43 44 45	46	47	48	49 50 51 52 53 54	55	56	57	58	59	60	61

Code number [ ][ ][ ][1][7] (1 2 3 4 5)

6 7 8 9	10 11 12 13 14 15 16 17	18	19	20	21 22 23 24 25 26	27	28	29	30	31	32	33
34 35 36 37	38 39 40 41 42 43 44 45	46	47	48	49 50 51 52 53 54	55	56	57	58	59	60	61

A = anti-social act NP = no promise F = focus U = uncertainty C = conflict OS = objective severity
GS = general severity CO = coping H = health T = tag

APPENDIX VI THE ASSESSMENT OF SOCIAL SUPPORT

SOCIAL CONTACTS

Code No. [ ][ ][ ] (1 2 3) Card [2] (4)

** "Now I want to ask you in some detail about your family and friends and the people round you and how often you see them. This is because we are very interested in how many good friends people have, and in how that may affect how they feel.
Are your parents living?"

0 Both dead
1 Father alive, mother dead
2 Mother alive, father dead
3 Both alive

[ ] (5)

IF NOT:

When did your mother/father die? (Deaths in current year code 00)

Number of years ago natural mother died [ ][ ] (6 7) Age of S at death of mother [ ][ ] (8 9)

Number of years ago natural father died [ ][ ] (10 11) Age of S at death of father [ ][ ] (12 13)

** Were you separated from either or both of your parents for a year or more as a child?

0 No
1 Mother
2 Father
3 Both

[ ] (14)

IF NO:

Were you mainly brought up by your parents or by somebody else?

IF YES:

When was that?

Age of S at time of first separation from either parent of more than one year [ ][ ] (15 16)

Why did that happen?

Reason for the separation [ ] (17)

Parents separated 1
Parents divorced 2
Death of parent(s) 3
S taken into care by local authority 4
S placed in a home by the parents 5
S given to some other relatives to bring up 6
Illness of parent 7
Other reasons (specify) 8

** IF S IS A WIDOW:

When did your husband die?

Number of years ago husband died (last husband) [ ][ ] (18 19)

IF S IS DIVORCED OR SEPARATED:

When were you first separated from your husband?

Number of years ago first separation from husband occurred [ ][ ] (20 21)

** What about other family members? Have any of them died?
PROBE: Brothers? Sisters? Children? (Include adopted children)

IF YES: When was that?

** Have you ever had any miscarriages, or had any pregnancy terminated, or suffered any stillbirths?

IF YES: GET DATES

** Have you had any of your children adopted, or brought up by other relatives, or taken into care or anything like that?

IF YES: GET DATES AND REASONS

IF SIBLING(S)

Age of S at time of death of:

1st Sib. [ ][ ] 22 23 2nd Sib. [ ][ ] 24 25 3rd Sib. [ ][ ] 26 27 4th Sib. [ ][ ] 28 29 5th Sib. [ ][ ] 30 31

(Code 88 if S cannot remember date. Do not count Sibs dying before S born, or Sibs aborted.)

IF CHILD(REN) (i.e. age < 17 years)
(Death includes miscarriage/termination/stillbirth)

	Reason for 1st loss/death	Age of S at time of 1st loss/death	Age of child at time of 1st loss/death
1st child	[ ] 32	[ ][ ] 33 34	[ ][ ] 35 36
2nd child	[ ] 37	[ ][ ] 38 39	[ ][ ] 40 41
3rd child	[ ] 42	[ ][ ] 43 44	[ ][ ] 45 46
4th child	[ ] 47	[ ][ ] 48 49	[ ][ ] 50 51
5th child	[ ] 52	[ ][ ] 53 54	[ ][ ] 55 56

Reason codes:
1 = Given for adoption
2 = Voluntarily given to another relative to bring up (permanent arrangement)
3 = Temporarily given to someone else due to family circumstances (e.g. parents abroad, ill, etc., temporarily means at least 1 year)
4 = Child taken into care compulsorily
5 = Other (e.g. child runs away from home)
6 = Death of child

Age of child codes for:
miscarriage = 90
termination = 91
stillbirth = 92
loss/death within one month of birth = 93
loss/death aged one month to one year = 94

Household Members + Guests Staying or Expected to Stay for at least One Month

** Could you tell me who is living with you in the household at the moment?

If you wanted to get hold of ..... in a hurry, could you do it?

Name of Person and relationship to S	Availability (adults only)	Age (children only)	Relationship rating
_____	57	58 59	60
_____	61	62 63	64
_____	65	66 67	68
_____	69	70 71	72
_____	73	74 75	76
_____	77	78 79	80
_____	5	6 7	8
_____	9	10 11	12
_____	13	14 15	16
_____	17	18 19	20

Code No. (1 2 3) Car (3 / 4)

1 = Virtually unavailable (e.g. no phone)

2 = "S" no phone but household member has (e.g. at work)

3 = Both parties have phone directly available

Children up to 2 years get coded 01

H = husband
COH = cohabitee
B = son (blood or adopted)
G = daughter (blood or adopted)
M = mother
F = father
SIS = sister
BRO = brother
GM = grandmother
GF = grandfather
MIL = mother-in-law
FIL = father-in-law
O = other relative
OP = other person (non-relative)
BIL = son-in-law
GIL = daughter-in-law
FI = fiancée

SOCIAL CONTACTS — CONFIDANTS

** Supposing there was some crisis or emergency and you needed to talk things over with somebody, is there anybody in the family or outside it, that you could turn to and share your troubles with?

IF S NOW MENTIONS SEVERAL PEOPLE ASK:

"Who would you go to first?"

1) Identity

Code:
0 = No confidant
1 = Spouse
2 = Parent
3 = Sibling
4 = Child
5 = Friend, not neighbour
6 = Neighbour
7 = Cohabitee
8 = Other relative
9 = Other person

"Can you tell (NAME OF PERSON) absolutely everything - all your aches and pains and so forth?"

2) Quality

Code:
1 = Cannot tell everything
2 = Can tell everything
3 = Can but does not tell everything

"Is he/she always available if you need him/her?"

3) Availability

Code:
1 = More than 50 miles away cannot be contacted by phone
2 = As (1) except at least confidant has phone
3 = Easily contacted but not guaranteed to attend to 'S' immediately (e.g. doctors, priest, social workers) or not easily contactable a large part of the time, e.g. commercial traveller
4 = Easily available part of each day but either difficult to contact or could not be present within the hour for the rest of the day
5 = Available virtually anytime, can be contacted quickly, e.g. by phone and be present within the hour

"Do you think that he/she tells you all his/her worries troubles and aches and pains?"

4) Reciprocity

Code:
1 = Tells S all their troubles
2 = Does not tell S all their troubles (or S uncertain that they do)

"How often roughly have you contacted each other in the last month?"

5) Frequency

Code:
0 = No contact in last month
1 = Less than 1/week
2 = 1/week
3 = More than 1/week but less than daily
4 = Daily
5 = Living with S

6) Relationship Rating

Best Confidant	21	22	23	24	25	26

** Is there anybody else you could turn to?
IF YES: REPEAT THE PROCEDURE FOR UP TO TWO OTHER CONFIDANTS

2nd Confidant	27	28	29	30	31	32
3rd Confidant	33	34	35	36	37	38

SOCIAL CONTACTS — OTHER CLOSE RELATIVES

INCLUDE ONLY Husband (H), Parents (M and F), Brothers (BRO), Sisters (SIS), Sons (B), Daughters (G), Fiancé (FI), Step-parents, step-sons, step-siblings (put S in front of the abbreviation) e.g. SM = step-mother, SB = step-son. Half brothers and sisters (put H in front of the abbreviation). Mother-in-law (MIL), Father-in-law (FIL). Not aunts, uncles, nephews, nieces, cousins.

** Have you any other close relatives who live IN EDINBURGH?

Any brothers or sisters? Fiancé etc? (RECORD NAME(S) AND ENTER 1 IN "WHERE LIVING")

** Have you any other close relatives who live OUTSIDE EDINBURGH?

Any brothers or sisters, etc? (RECORD NAME(S) AND APPROPRIATELY CODE "WHERE LIVING")

Now I am going to ask you to tell me roughly how often you have seen, telephoned or written to each of the relatives you have just mentioned over the past month.

FOR EACH RELATIVE ASK: EACH month, how often, roughly, have you been to see (NAME OF PERSON)? Would it be more or less than 1/week?
(Determine code from entire list of relatives, then move to next column.)

Do you phone each other? IF YES Code 1 or 3 ___ (ENTIRE LIST)

Do you write to each other? IF YES Code 1 or 3 ___? (ENTIRE LIST)

FREQUENCY OF CONTACT

Person and relationship to S	Where living?	Due to S visiting other	S visiting	Telephone contacts	Letter contacts	Relationship Rating
_____	39	40	41	42	43	44
_____	45	46	47	48	49	50
_____	51	52	53	54	55	56
_____	57	58	59	60	61	62
_____	63	64	65	66	67	68
_____	69	70	71	72	73	74
_____	75	76	77	78	79	80
_____	5	6	7	8	9	10
_____	11	12	13	14	15	16
_____	17	18	19	20	21	22

Code No. [ ][ ][ ] Card [4]

Codes: 1=Edinburgh, 2=Elsewhere Scotland, 3=Outside Scotland, 4=N.K.

Codes: 0=No, 1=Less than 1/week, 3=More than 1/week

(Where someone stays with S for a time during the month, each day counts as 1 contact, average total contacts during the month to determine code, e.g. staying 10/7 = code 3. People who moved during the past month get recorded as in their present place of residence.)

SOCIAL CONTACTS - Diffuse support

Probe to see that each new contact is seen at least 1/FORTNIGHT. Do not count anyone seen less than this. Count everybody including children. Don't include those already mentioned (e.g. confidants, etc.). In the boxes record single figures as 01, 05, 08, etc. Ask the subject to count up in her mind all the people she meets for a chat under any given heading. If she gives you a final answer greater than 20, put 20 in the boxes, but do not ask her directly whether there are more or less than 20.

** We are interested in the number of people that you come in contact with in your day to day living. What's it like where you work? Do you meet many people there or just a few? [ ][ ] 23 24

In the past month, how many of these do you have a chat with from time to time? [ ][ ] 25 26

Are there any people from work whom you see out of work hours? (Exclude people already covered.) [ ][ ] 27 28

If S not working code 99

** How about your neighbours and people who live close by? How many of these do you regularly talk to and get on well with in the past month? [ ][ ] 29 30

** In the past month have you ever seen any other relatives that we have not already mentioned? [ ][ ] 31 32

** Are you active in any formal club like a church or trade union, or woman's organisation?

IF YES:

Are you involved in running ..... in any way?

THEN:

How often have you been to ..... in the past month?

If more than or equal to 1/FORTNIGHT code all relevant boxes

If less than 1/FORTNIGHT do NOT code number of people met

How many people do you meet there that we have not already covered?

Name of "Club"	Organiser/Member	Frequency	No. of people met
_____	[ ] 33	[ ] 34	[ ][ ] 35 36
_____	[ ] 37	[ ] 38	[ ][ ] 39 40
_____	[ ] 41	[ ] 42	[ ][ ] 43 44
_____	[ ] 45	[ ] 46	[ ][ ] 47 48
_____	[ ] 49	[ ] 50	[ ][ ] 51 52
_____	[ ] 53	[ ] 54	[ ][ ] 55 56
	Organiser = 1 Member = 2	More than or equal to 1/fortnight = 1 Less than 1/fortnight = 0	Total no. of clubs [ ] 57

** What about more informal groups like the pub or bingo?

Name of Gathering	No. of people met
_____	58 59
_____	60 61
_____	62 63

Total no. of gatherings 64

Other contacts not covered

** Is there anybody else that you see regularly that you have not already talked about?

No. of people 65 66

Pets

** Have you any pets in the household?

Doesn't have a pet = 0
Has a pet = 1 67

Pet in the house more than 1 year = 1
Pet in the house 1 year or less = 2 68